RC-2201/02
User's Manual

Managed Media Converter
Release 1.0

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Caution

Circuit devices are sensitive to static electricity, which can damage their delicate electronics. Dry weather conditions or walking across a carpeted floor may cause you to acquire a static electrical charge.

To protect your device, always:

- Touch the metal chassis of your computer to ground the static electrical charge before you pick up the circuit device.
- Pick up the device by holding it on the left and right edges only.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a class A computing device pursuant to Subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

European Community (CE) Electromagnetic Compatibility Directive

This equipment has been tested and found to comply with the protection requirements of European Emission Standard EN55022/EN60555-2 and the Generic European Immunity Standard EN50082-1.

EMC:	EN55022(1988) /CISPR-22(1985)	class A
	EN60555-2(1995)	class A
	EN60555-3	
	IEC1000-4-2(1995)	4K V CD, 8KV, AD
	IEC1000-4-3(1995)	3V/m
	IEC1000-4-4(1995)	1KV – (power line), 0.5KV – (signal line)

1. Introduction

1-1. Overview

RC-2201/02 Managed Media Converter is designed to make conversion between 10/100/1000Base-TX and 1000Base-FX Fast Ethernet. With SNMP agent, web-based management and Telnet text-based manual driven management, the network administrator can logon the converter to monitor, configure and control the activity of each port. In addition, the converter implements bandwidth rating management capability via the intelligent software. The overall network management is enhanced, and the network efficiency is also improved to accommodate and deliver high bandwidth applications.

1-2. Features

The RC-2201/02 Managed Media Converter provides the following features for users to perform system network administration.

Management :

- Port Status, Counter and Configuration.
- Display the basic System Information on user interface.
- System configuration which includes administrator, guest users and IP address relative to parameters and SNMP basic parameters.
- Maximal packet length can be up to 1536 bytes.
- Broadcasts suppression to avoid for power lost and recovery while a bunch of converter boxes register to NMS simultaneously.
- The trap events alarm can be sent via e-mail and mobile phone short message. It includes Case Intrusion Detection.
- A configured setting can be saved into the on-board flash memory. And the current setting can be recovered from the default setting or the previous configured setting.
- On-board diagnostics function can let administrator know the hardware status.
- On-board firmware can be updated via TFTP function.
- The converter allows administrator to reboot system from management station.
- The converter will log the last 60 trap records in the flash memory and display on the local console. And the converter will send out the record message while fiber connection recovered.

1-3. Checklist

Before you start installing the converter, verify that the package contains the following:

- SNMP-enabled Managed Media Converter
- AC-DC Power adapter
- RS232 Cable
- Plastic pad and wall-mount screw
- Battery (for RC-2202 only)
- This User' s Manual

Please notify your sales representative immediately if any of the aforementioned items is missing or damaged.

1-4. View of the Converter

Fig. 1-1 Full View of the Managed Media Converter

1-4-1. User Interfaces on the Front View (Button, LEDs and Plugs)

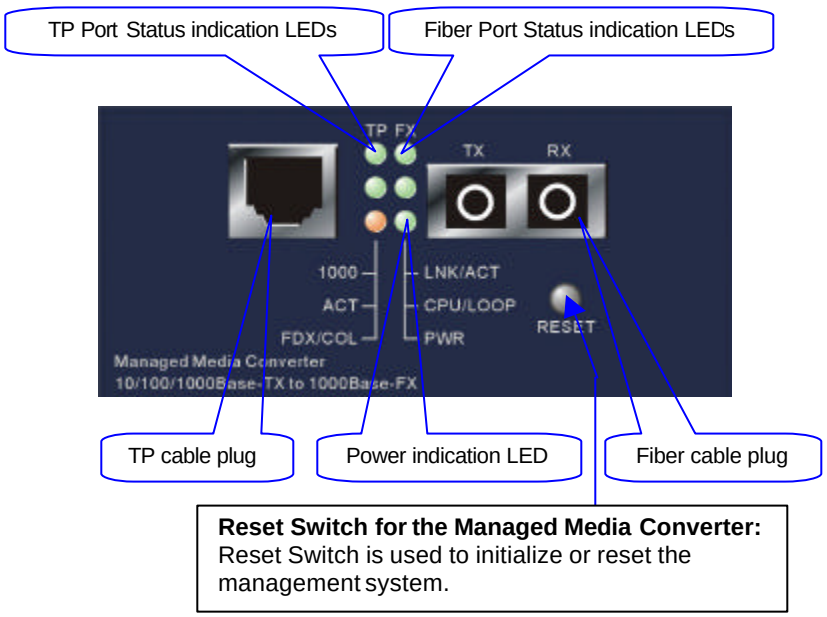


Fig. 1-2 Front View of the Managed Media Converter

LED Indicators

LED	Color	Function
System LED		
Power	Green	Lit when +5V power is on and good
PU/Loop	Green	Lit when CPU is on and good Blinks when loop test is present
10/100/1000Mbps Ethernet TP Port LED		
Link1000	Green	Lit when 1000Mbps connection with remote device is good Off when 10/100Mbps connection with remote device is good or cable connection is not good
ACT	Green	Blinks when any traffic is present
FDX/COL	Amber	Lit when full-duplex mode is active Off when half-duplex mode is active Blinks when any collision is present
1000Mbps Fast Ethernet FX Port LED		
Link/ACT	Green	Lit when connection with remote device is good Blinks when any traffic is present Off when cable connection is not good

1-4-2. User Interfaces on the Rear Panel View

The serial port cable is attached directly to a DCE device through RS232 cable for console management.

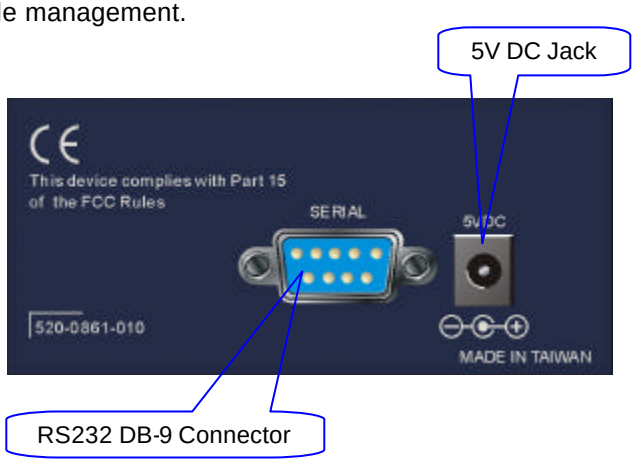


Fig. 1-3 Rear View of the Managed Media Converter

2. Installation

2-1. Network System Wide Basic Configuration

The RC-2201/02 Converter has RJ-45 with auto MDIX and Fiber connection for different types SC/ST, MT-RJ, VF-45, LC, Bidi/LC and Bidi/SC.

Two typical applications for the RC-2201/02 Converter:

- Remote site application is used in carrier or ISP (See Fig. 2-1)
- Peer-to-peer application is used in two remote offices (See Fig. 2-2)

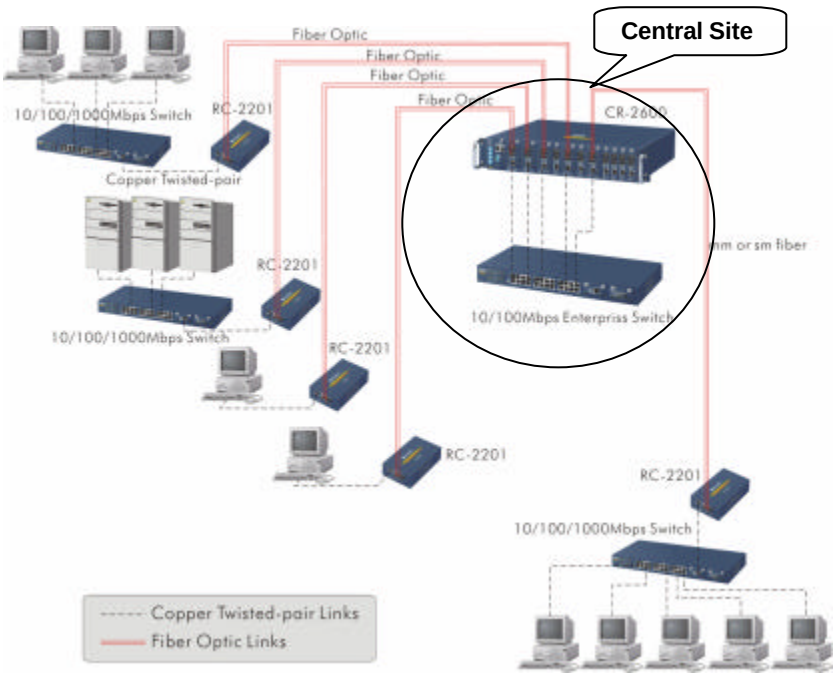


Fig. 2-1 Network Connection between Remote Site and Central Site

Fig. 2-1 is a system wide basic reference connection diagram. This diagram demonstrates how RC-2201/02 Converter connects with other network devices and hosts.

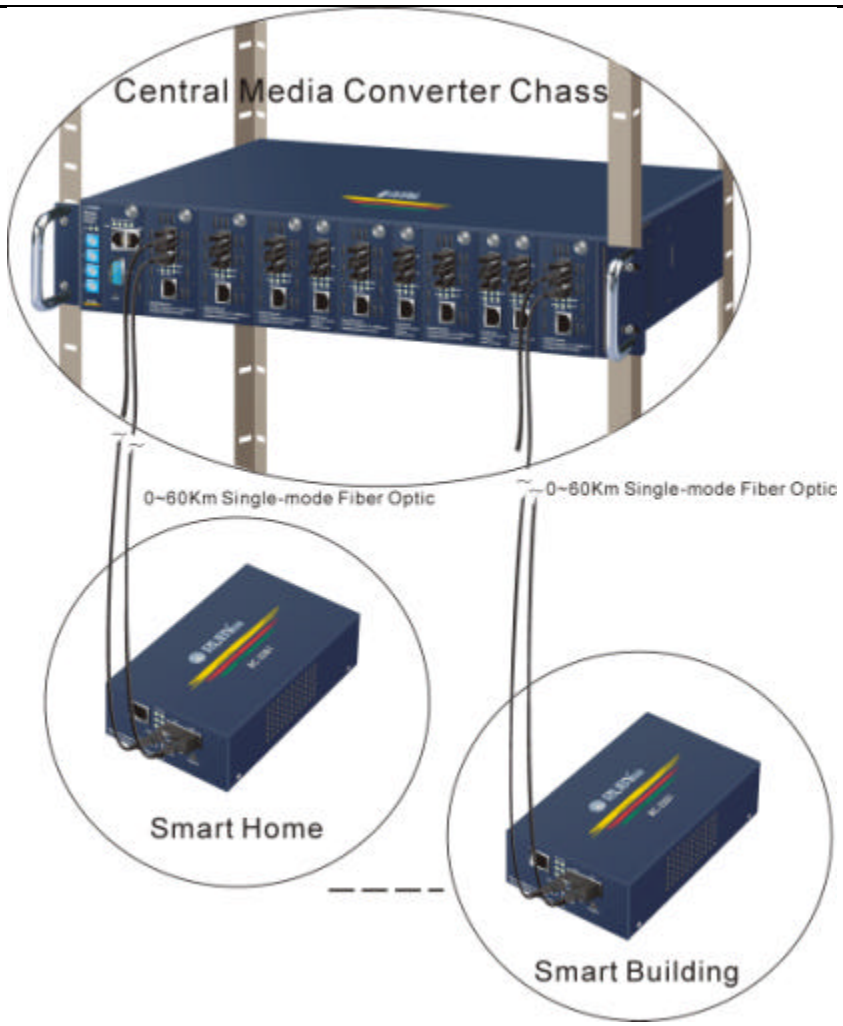


Fig. 2-2 Single-mode Fiber Optic Network Configuration

The Managed Media Converter embedded web server, SNMP agent and Telnet software, etc. can be used at a remote PC with any installed web browser, SNMP or Telnet application to do network management. PC Web/SNMP Network Management station can be installed at either the central or user site.

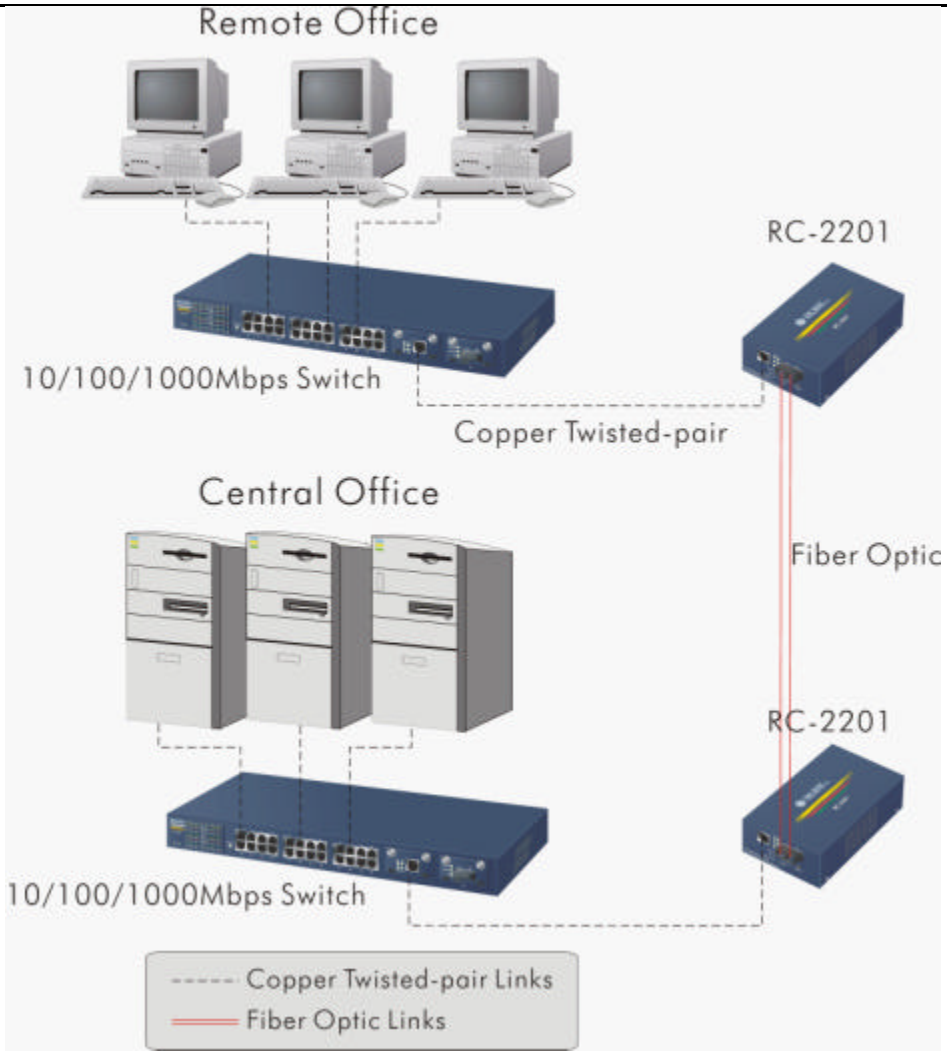


Fig. 2-3 Office-to-Office Network Connection

2-2. Starting RC-2201/02 up

This section will give users a quick start for:

- Battery Installation (For RC-2202 Only)
- Cable and Hardware Installation
- Management Station Installation
- Software booting and configuration

2-2-2. Cable and Hardware Installation

⇒ Wear a grounding device for electrostatic discharge

⇒ Verify that the AC-DC adapter conforms to your country AC power requirement and then insert the power plug

- **TP Cable**

⇒ Use Cat. 5 TP cable to connect server/host or workstation to TP port of the converter

⇒ TP port supports MDI/MDI-X auto-crossover, use straight-through cable (Cable

pin-outs for RJ-45 jack 1, 2, 3, 6 to 1, 2, 3, 6) to cascade or up-link the converter to an upper layer converter

⇒ TP Cable Limitations: Cat. 5 and up to 100m

- **Fiber Cable**

⇒ Use fiber cable to connect server/host or workstation to FX port of the converter

⇒ To help ensure a successful installation, you must observe the following cabling parameter. Violating these rules can render the LAN to work poorly

1000Base-SX 850nm Fiber Models	Multi-mode Fiber Cable and Modal Bandwidth				
	Multi-mode 62.5/125μm		Multi-mode 50/125μm		
	Modal Bandwidth	Distance	Modal Bandwidth	Distance	
	160MHz-Km	* 220m	400MHz-Km	500m	
	200MHz-Km	275m	500MHz-Km	550m	
1000Base-LX Fiber Models	RC-2201.ZSC.212.10/30/50Km				
	Single-mode Fiber 9/125μm				
	Single-mode transceiver 1310nm *10Km				
	Single-mode transceiver 1550nm 30, 50Km				
1000Base-FX Single Fiber WDM Models	RC-2201.ZBS.621.201	Single-Mode *20Km	TX(Transmit)	1550nm	
			RX(Receive)	1310nm	
	RC-2201.ZBS.621.202	Single-Mode *20Km	TX(Transmit)	1310nm	
			RX(Receive)	1550nm	

*: Default module

Note:

- The other side of the fiber cable plugged into the converter' s RX connector at the near end should plug into the FX device' s TX connector at the far end, and vice versa.
- RC-2201.ZBS.621.201 and RC-2201.ZBS.621.202 must be installed in pairs, i.e. install RC-2201.ZBS.621.201 at one end and RC-2201.ZBS.621.202 at the other end.

2-2-3. Management Station Installation

RC-2201/02 converter is equipped with the serial port (RS232), Ethernet 10/100/1000 TP port and Ethernet 1000FX port. The users can use any port to access and set up system configuration of RC-2201/02 converter.

Section 2-2-3-1: Installing management station through RC-2201/02 converter' s RS232 port running Terminal utility.

Section 2-2-3-2: Installing management station through RC-2201/02 converter' s TP Port running Telnet or browser software.

Section 2-2-3-3: Installing management station through RC-2201/02 converter' s Fiber Port running Telnet or browser software via Central Site Converter Chassis.

RC-2201/02 converter, Telnet and browser stations must assign the proper IP address, subnet mask and default Gateway accordingly.

2-2-3-1. Installing Management Station through RC-2201/02 RS232 Port

The serial port cable is attached directly to a DCE device through RS232 cable for console management.

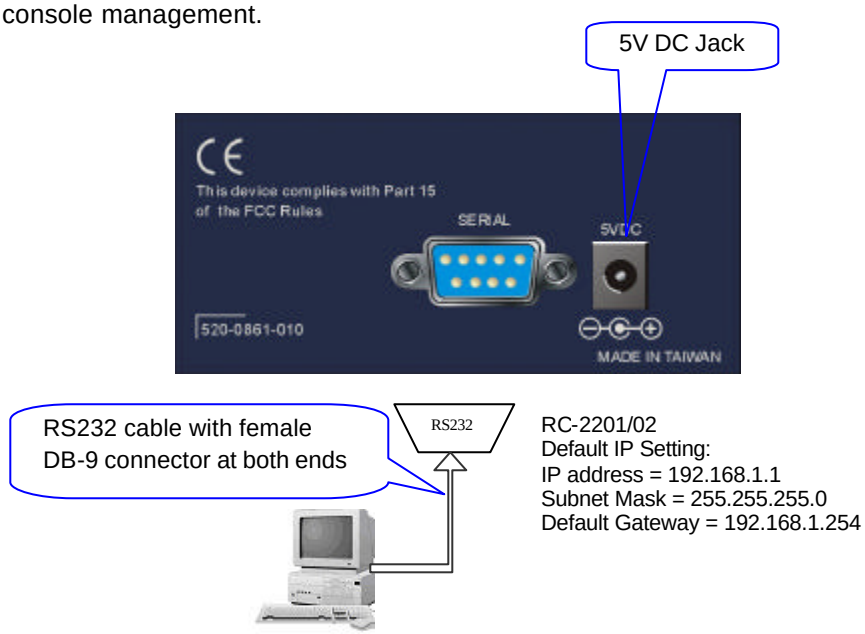


Fig. 2-4

To connect the Managed Media Converter to the console user interface:

1. Locate the correct DB-9 serial port RS232 cable with female DB-9 connector.
2. Attach the DB-9 female cable connector to the male DB-9 serial port connector on the Managed Media Converter.
3. Attach the other end of the DB-9 serial port cable to an ASCII terminal emulator. For example, Windows98/2000/XP HyperTerminal utility.

RC-2201/02 converter uses the following serial port parameter values:

Baud rate	57600
Stop bits	1
Data bits	8
Parity	N
Flow control	none

4. When the terminal emulator connected to RC-2201/02, then press **<Enter>** key, the login prompt will be shown on the screen. The default username and password are shown as below:

Username = admin
Password = admin

5. Please refer to Chapter 4 Console Management for details about console user interface operating description.

2-2-3-2. Installing Management Station through RC-2201/02 TP Port

RC-2201/02
Default IP Setting:
IP = 192.168.1.1
Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.254

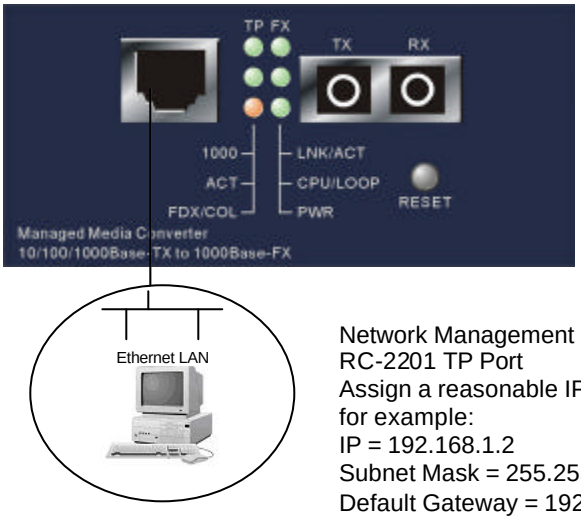


Fig. 2-5

Network Management Station through
RC-2201 TP Port
Assign a reasonable IP address,
for example:
IP = 192.168.1.2
Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.254

In Fig. 2-5, it is a simple example to show you the first step to connect to your PC and the converter.

1. Attach Cat. 5 TP cable to connect PC and TP port of the RC-2201/02 converter.
2. Boot up the converter.
3. Either run a terminal simulator and invoke a telnet session on PC, or run browser software.

Right now, you can read the menu with text screen as Fig. 2-6. Input the default username "admin" and the default password "admin", then you'll read the next page as Fig. 2-7.

Use the Up/Down **<Arrow>** keys to move the cursor to locate the entry of the Configuration in the menu, then press **<Enter>** key on the PC to select the item. Now, the page for IP address configuration is shown and then also moves the cursor to the entry of the IP Configuration, then press **<Enter>** key to select the item you choose.

Managed Media Converter – RC-2201/02

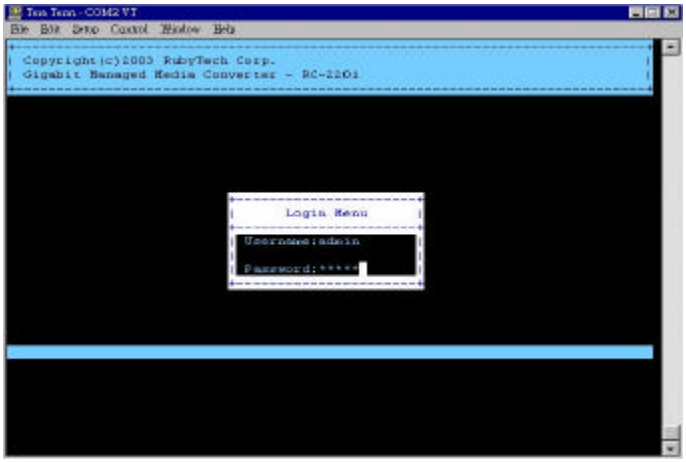


Fig. 2-6

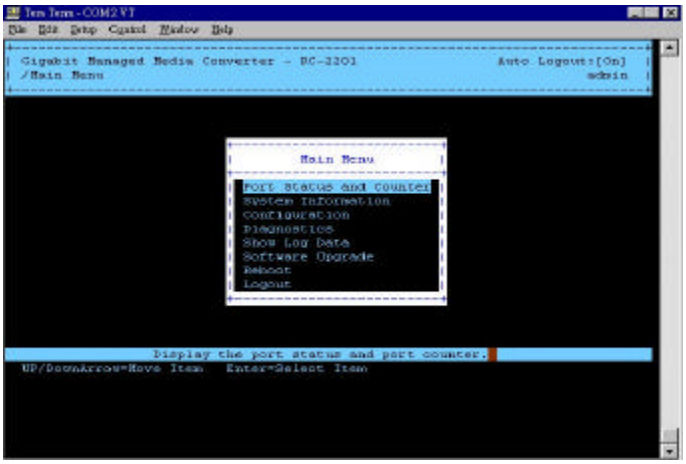


Fig. 2-7

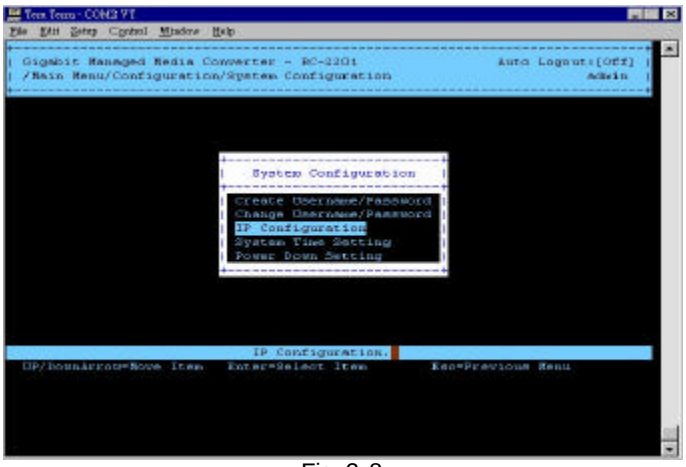


Fig. 2-8

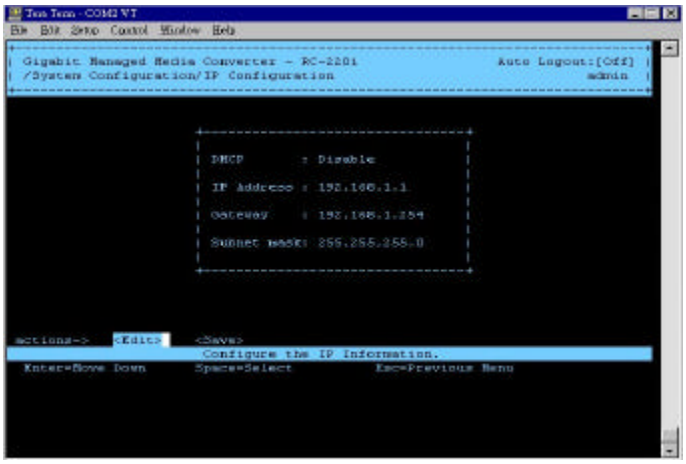


Fig. 2-9

2-2-3-3. Installing Management Station through RC-2201/02 Fiber Port via Central Site Converter Chassis

RC-2201/02
Default IP Setting:
IP = 192.168.1.1
Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.254

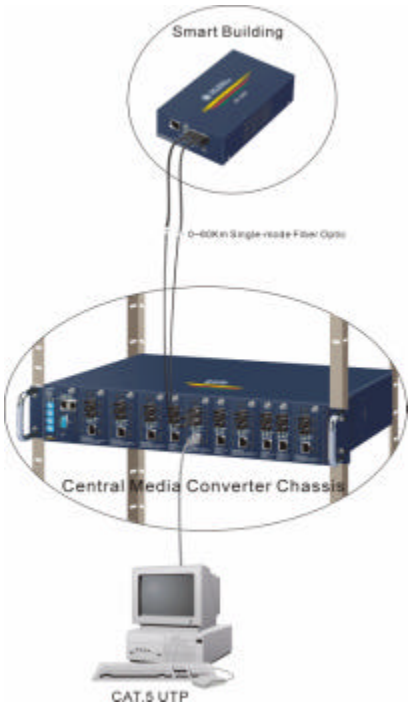


Fig. 2-10

Network Management Station through RC-2201/02 Fiber Port via Central Site Converter Chassis
Assign a reasonable IP address,
for example:
IP = 192.168.1.2
Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.254

Warning:

Both RC-2201/02 converter and PC/station' s IP must be in a same subnet, please assign a proper subnet mask.

To connect RC-2201/02 fiber port to the central site management station via fiber optic cable:

1. Locate the fiber network cable with the male fiber connector.
2. Attach the male fiber connector to the Managed Media Converter.

3. Attach the other end of cable to the Central Media Converter Chassis.
4. At central site:
   - Install and connect a PC to TP port of the Central Media Converter Chassis with Cat. 5 UTP network cable (or via a switch)
   - Assign a reasonable public or private IP address in accordance with each network site.

Please refer to Fig. 2-10 about the Managed Media Converter default IP address information.

2-2-4. IP Address Assignment

For IP address configuration, there are three parameters needed to be filled in. They are IP address, Subnet Mask and Default Gateway.

IP address:

The address of the network device in the network is used for internetworking communication. Its address structure looks is shown in the Fig. 2-11. It is "classful" because it is split into predefined address classes or categories.

Each class has its own network range between the network identifier and host identifier in the 32 bits address. Each IP address comprises two parts: network identifier (address) and host identifier (address). The former indicates the network where the addressed host resides, and the latter indicates the individual host in the network which the address of host refers to. And the host identifier must be unique in the same LAN. Here the term of IP address we used is version 4, known as IPv4.

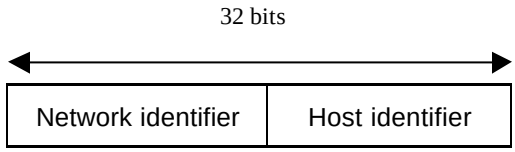
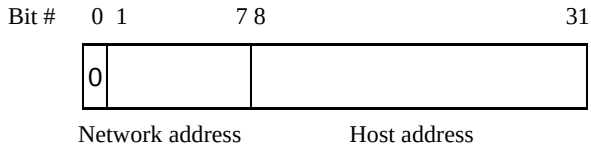


Fig. 2-11 IP address structure

With the classful addressing, it divides IP address into three classes, class A, class B and class C. The rest of IP addresses are for multicast and broadcast. The bit length of the network prefix is the same as that of the subnet mask and is denoted as IP address/X, for example, 192.168.1.0/24. Each class has its address range described below.

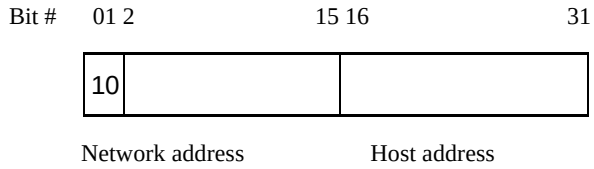
Class A:

Address is less than 126.255.255.255. There are a total of 126 networks can be defined because the address 0.0.0.0 is reserved for default route and 127.0.0.0/8 is reserved for loopback function.



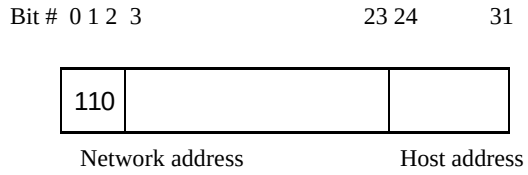
Class B:

IP address range between 128.0.0.0 and 191.255.255.255. Each class B network has a 16-bit network prefix followed 16-bit host address. There are 16,384 (2^14)/16 networks able to be defined with a maximum of 65534 (2^16 –2) hosts per network.



Class C:

IP address range between 192.0.0.0 and 223.255.255.255. Each class C network has a 24-bit network prefix followed 8-bit host address. There are 2,097,152 (2^21)/24 networks able to be defined with a maximum of 254 (2^8 –2) hosts per network.



Class D and E:

Class D is a class with first 4 MSB (Most significance bit) set to 1-1-1-0 and is used for IP Multicast. See also RFC 1112. Class E is a class with first 4 MSB set to 1-1-1-1 and is used for IP broadcast.

According to IANA (Internet Assigned Numbers Authority), there are three specific IP address blocks reserved and able to be used for extending internal network. We call it Private IP address and list below:

Class A	10.0.0.0 --- 10.255.255.255
Class B	172.16.0.0 --- 172.31.255.255
Class C	192.168.0.0 --- 192.168.255.255

Please refer to RFC 1597 and RFC 1466 for more information.

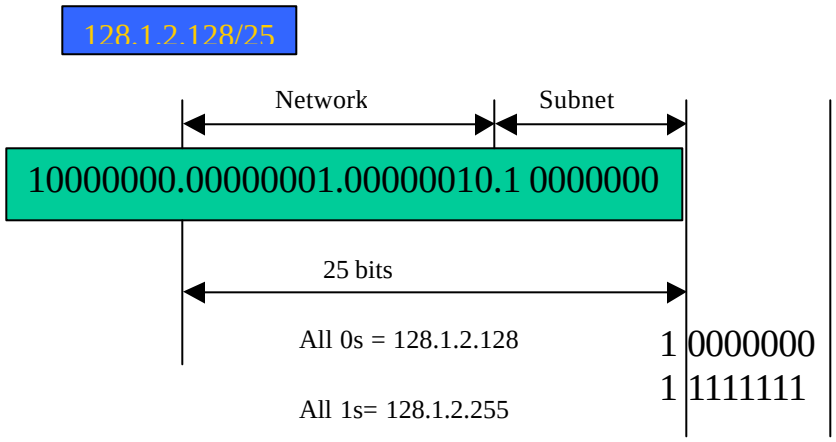
Subnet mask:

It means the sub-division of a class-based network or a CIDR block. The subnet is used to determine how to split an IP address to the network prefix and the host address in bitwise basis. It is designed to utilize IP address more efficiently and ease to manage IP network.

For a class B network, 128.1.2.3, it may have a subnet mask 255.255.0.0 in default, in which the first two bytes is with all 1s. This means more than 60

thousands of nodes in flat IP address will be at the same network. It' s too large to manage practically. Now if we divide it into smaller network by extending network prefix from 16 bits to, say 24 bits, that' s using its third byte to subnet this class B network. Now it has a subnet mask 255.255.255.0, in which each bit of the first three bytes is 1. It' s now clear that the first two bytes is used to identify the class B network, the third byte is used to identify the subnet within this class B network and, of course, the last byte is the host number.

Not all IP address is available in the sub-netted network. Two special addresses are reserved. They are the addresses with all zero' s and all one' s host number. For example, an IP address 128.1.2.128, what IP address reserved will be looked like? All 0s mean the network itself, and all 1s mean IP broadcast.



In this diagram, you can see the subnet mask with 25-bit long, 255.255.255.128, contains 126 members in the sub-netted network. Another is that the length of network prefix equals the number of the bit with 1s in that subnet mask. With this, you can easily count the number of IP addresses matched. The following table shows the result.

Prefix Length	No. of IP matched	No. of Addressable IP
/32	1	-
/31	2	-
/30	4	2
/29	8	6
/28	16	14
/27	32	30
/26	64	62
/25	128	126
/24	256	254
/23	512	510

/22	1024	1022
/21	2048	2046
/20	4096	4094
/19	8192	8190
/18	16384	16382
/17	32768	32766
/16	65536	65534

According to the scheme above, a subnet mask 255.255.255.0 will partition a network with the class C. It means there will have a maximum of 254 effective nodes existed in this sub-netted network and is considered a physical network in an autonomous network. So it owns a network IP address which may looks like 168.1.2.0.

With the subnet mask, a bigger network can be cut into small pieces of network. If we want to have more than two independent networks in a worknet, a partition to the network must be performed. In this case, subnet mask must be applied.

For different network applications, the subnet mask may look like 255.255.255.240. This means it is a small network accommodating a maximum of 15 nodes in the network.

Default gateway:

For the routed packet, if the destination is not in the routing table, all the traffic is put into the device with the designated IP address, known as default router. Basically, it is a routing policy.

For assigning an IP address to RC-2201, you just have to check what the IP address of the network will be connected with RC-2201. Use the same network address and append your host address to it.

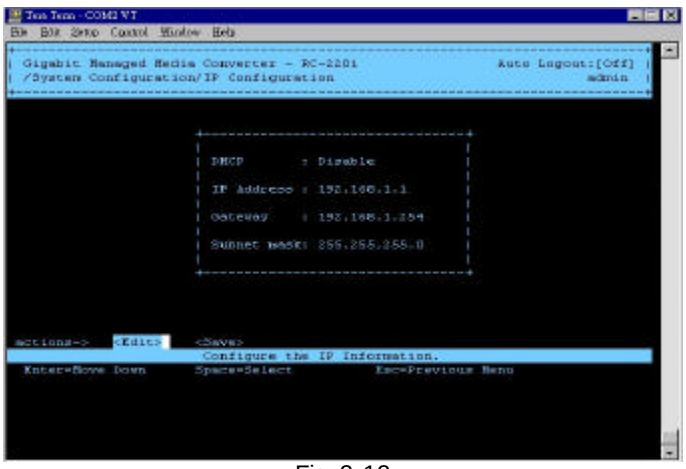


Fig. 2-12

First, IP Address: as shown in the Fig. 2-12, enter “192.168.1.1”, for instance. For sure, an IP address such as 192.168.1.x must be set on your PC.

Second, Subnet Mask: as shown in the Fig. 2-12, enter “255.255.255.0”. Any subnet mask such as 255.255.255.x is allowable in this case.

3. Operation of Web-based Management

This chapter instructs you how to configure and manage the converter RC-2201/02 through the web user interface it supports. The RC-2201/02 Managed Media Converter provides 1 10/100/1000Mbps TP Port + 1 1000Mbps Fiber port. With this facility, you can easily access and monitor all the status of the converter through any one port of the RC-2201/02.

The default values of RC-2201/02 Converter are listed in the table below:

IP Address	192.168.1.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.254
Username	admin
Password	admin

Table 3-1

After the Managed Media Converter has been finished configuring in the console via the converter's serial interface, you can browse it. For instance, type http://192.168.1.1 in the address row in a browser, it will show the following screen (see Fig.3-1) and ask you inputting username and password in order to login and access authentication. The default username and password are both "admin". For the first time to use, please enter the default username and password, then click the **<Login>** button. The login process now is completed.

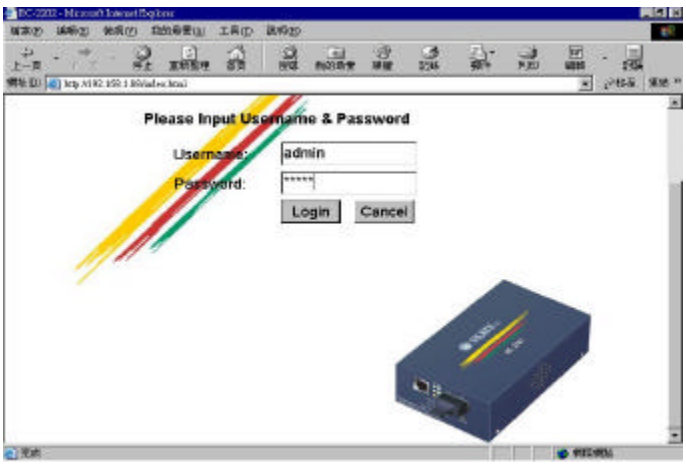


Fig. 3-1

3-1. Web Management Home Overview

After you login, RC-2201/02 shows you the system information as Fig. 3-2. This page is default and tells you the basic information of system, including "Model Name", "System Description", "Location", "Contact", "System Up Time", "Current Time", "Mac Address", "BIOS Version", "Firmware Version", "Hardware-Mechanical Version", "RAM Size", "Flash Size", "System Temperature", "Series Number", "Device Port", and "Case Detection". With this information, you will know the software version used, MAC address, serial number and so on. This is helpful while malfunctioning.

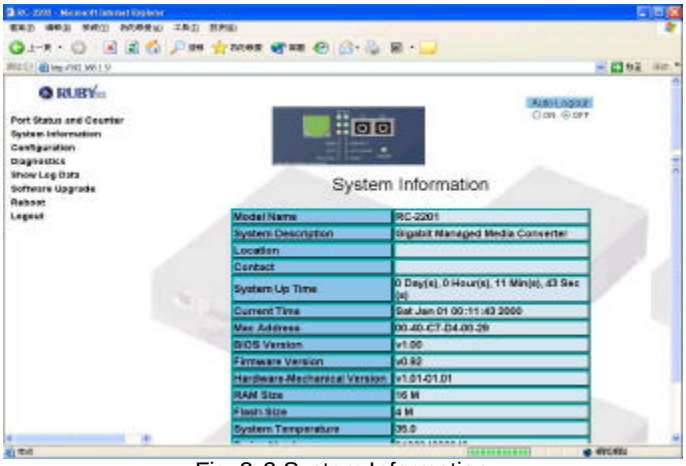


Fig. 3-2 System Information

On the top side, it shows the front panel of RC-2201/02. In the front panel, the linked ports will display green; as to the ports which fail to link or disconnected will be dark.

For the convenience to view the status of the port, you can just click the port, and then an information window for the port will pop out. (See Fig. 3-3)

Fig. 3-3 Port status information

On the left side, the main menu tree for web is listed in the page. They are hierarchical menu. The function name in boldface is a function folder. Open the function folder, a sub-menu will be shown. The function name in normal type is the real function. When clicking it, the function is performed.

Here lists the main menu function tree for web. They are sequentially displayed as follows: "Port Status and Counter", "System Information", "Configuration", "Diagnostics", "Show Log Data", "Software Upgrade", "Reboot" and "Logout".

Function name:

System Information

Function description:

Show the basic system information.

Parameter description:

Model Name:

The model name of this product.

System Description:

Gigabit Managed Media Converter

Location:

Basically, it is the location where this converter is put. User-defined.

Contact:

User can configure this parameter via SNMP Set. It belongs to string format.

System Up Time:

The time accumulated since this converter is powered up. Its format is day, hour, minute, second.

Current Time:

Show the system time of RC-2201/02. Its format: day of week, month, day, hours : minutes : seconds, year. For instance, Wed, Apr. 23, 12:10:10, 2003.

MAC Address:

It is the MAC address of the management agent in this converter.

BIOS Version:

The version of the BIOS in this converter.

Firmware Version:

The firmware version in this converter.

Hardware-Mechanical Version:

The version of Hardware and Mechanical. The figure before the hyphen is the version of electronic hardware; after the hyphen is the version of mechanical.

RAM Size:

The size of the DRAM in this converter.

Flash Size:

The size of the flash memory in this converter.

System Temperature:

The air temperature inside of this converter.

Series Number:

The serial number is assigned by Rubytech.

Device Port:

Show all types and numbers of the port in RC-2201/02.

Case Detection:

Show the status of the upper case of this converter. When the case is lid off, it shows “Open”; otherwise, it shows “Close”.

3-2. Port Status and Counters

Three functions, including "Port Current Status", "Port Counters" and "Port Configuration" are contained in this function folder for port monitoring and management. Each of them will be described in detail orderly in the following sections.

3-2-1.Port Current Status

The function Port Current Status gathers the information of all ports' current status and reports it by the order of port number, Link status, Port state, Auto-Negotiation status, Speed/Duplex, and Flow control.

Fig. 3-4 Port Current status

Function name:

Port Current Status

Function Description:

Report the latest updated status of all ports in this converter. When any one of the ports in RC-2201/02 changes its parameter displayed in the page, it will be automatically refreshed the port current status about every 5 seconds.

Parameter Description:

Port:

Display the port number. The number is 1 and 2.

Link Status:

Show that if the link on the port is active or not. If the link is connected to a working-well device, the Link will show the link "Up"; otherwise, it will show "Down". This is determined by the negotiation of hardware.

Port State:

Show that the communication capability of the port is "Enabled" or "Disabled". When it is enabled, traffic can be transmitted and received via this port. When it is disabled, no traffic can be transferred through this port. Port State is configured by user. Default is Enabled.

Auto Negotiation:

Show the exchange mode of Ethernet MAC. There are two modes supported in RC-2201/02. They are auto-negotiation mode "Enabled" and forced mode "Disabled". When in "Enabled" mode, this function will automatically negotiate by hardware itself and exchange each other the capability of speed and duplex mode with other site which is linked, and comes out the best communication way. When in "Disabled" mode, both parties must have the same setting of speed and duplex, otherwise, both of them will not be linked. In this case, the link status is "Down".

Default: Enabled mode

Speed / Duplex:

Display the speed and duplex of all port. There are three speeds 10Mbps, 100Mbps and 1000Mbps supported in RC-2201/02. The duplex supported is half duplex and full duplex. The status of speed/duplex mode is determined by 1) the negotiation of both local port and link partner in "Enabled" mode or 2) user setting in "Disabled" mode. The local port has to be preset its capability.

In port 1, it is supported 10/100/1000Mbps with TP media, so the result will show 10Mbps/Full duplex and 10Mbps/Half duplex, 100Mbps/Full duplex or 100Mbps/Half duplex, and 1G/Full.

In port 2, it is supported 1000Mbps with Fiber media, so the result will show 1G/Full only.

Default: None, depends on the result of the negotiation.

Flow Control:

Show each port's flow control status. There are two types of flow control in Ethernet, Backpressure for half-duplex operation and Pause flow control (IEEE802.3x) for full-duplex operation. RC-2201/02 supports both of them. When duplex mode is half duplex, there is only one status "Backpressure" for flow control. When in full duplex, it may be one of it may be one of "Symmetric", "Asymmetric", or "Disabled".

Default: Symmetric flow control if in full-duplex mode. Backpressure if in half-duplex mode.

Media Type:

Port	Media Type	Connector	Fiber Mode	Fiber Cable	Wavelength	Max. Distance	Speed
1	UTP	UTP	N/A	N/A	N/A	N/A	1G
2	Fiber Cable	SC	Multi-Mode	Two Wires	850nm	220m	1G

Table 4-2

Parameter description:

Media Type:

For port 1, only "UTP" is in this model.

For port 2, only "Fiber Cable" is in this model.

Connector:

Display the connector type, for instance, UTP, SC, ST, LC and so on.

Fiber Mode:

Display the fiber mode, for instance, Multi-Mode, Single-Mode.

Fiber Cable:

Display the cable type, for instance, Two Wires, Single wire.

Wave Length:

Display the wavelength of the light transmitted in the fiber, for instance, 850nm, 1310nm.

Max. Distance:

Display the maximum distance the port supported, for instance, 100m, 10km, 20km and so on.

Speed:

Display the maximum speed of the port, for instance, "1G", "100M".

3-2-2. Port Counters

The function Port Counter collects any information and provides the counting about the traffic of the port, no matter the packet is good or bad.

In Fig. 3-5, the window can show only one port counter information at the same time. To see another port' s counter, you have to click the button array labeled port number in the first row in Fig. 3-5. After selecting a port, you will see the figures displayed in other two rows.

Each data field has 12-digit long. If the counting is overflow, the counter will be reset and restart counting. The data is updated every time interval defined by the user. The valid range is 3 to 10 seconds. The Refresh Interval is used to set the update speed. Default update time is 5 seconds.

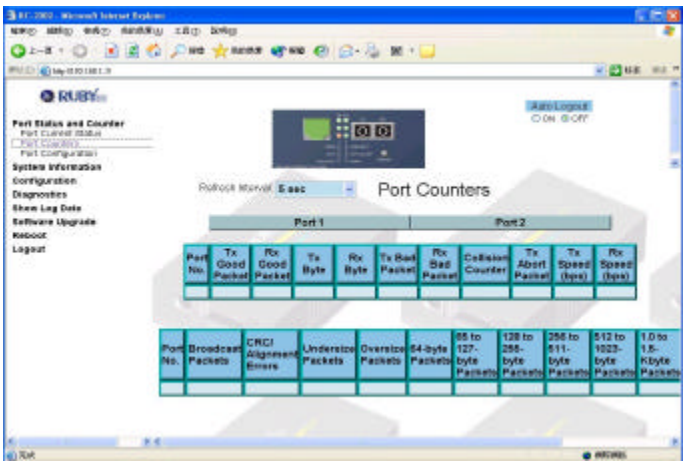


Fig. 3-5 Port Counters

Function name:

Port Counters

Function description:

Display the counting of each port' s traffic, sorted according to the items described in the parameter description.

Parameter description:

Tx Good Packet:

The counting number of the packet transmitted successfully.

Rx Good Packet:

The counting number of the packet received which is treated as good.

Tx Byte:

Total transmitted bytes.

Rx Byte:

Total received bytes.

Tx Bad Packet:

The counting number of the packet transmitted abnormally.

Rx Bad packet:

The counting number of the packet received which is treated as bad.

Collision Counter:

Collision times.

Tx Abort Packet:

The counting number of the packet aborted during transmission.

Tx Speed (bps):

Show the average transmission rate in bit per second. The time interval is user-defined.

Rx Speed (bps):

Show the average received data rate in bit per second. The time interval is user-defined.

Broadcast Packets:

Show the counting number of the broadcast packet.

CRC/Alignment Errors:

Show the counting number of the packet with CRC and Alignment error.

Undersize Packets:

Show the counting number of the packet with the length less than 64 bytes.

Oversize Packets:

Show the counting number of the packet with the length more than 1522/1536 bytes depend on maximum packet length setting.

64 byte Packets Received:

Show the counting number of the packet with exact 64 bytes length.

65-127 byte Packets Received:

Show the counting number of the packet with the length between 65 to 127 bytes.

128-255 byte Packets Received:

Show the counting number of the packet with the length between 128 to 255 bytes.

256-511 byte Packets Received:

Show the counting number of the packet with the length between 256 to 511 bytes.

512-1023 byte Packets Received:

Show the counting number of the packet with the length between 512 to 1023 bytes.

1.0-1.5k byte Packets Received:

Show the counting number of the packet with the length between 1024 to 1536 bytes.

Unicast Packets Transmitted:

Show the counting number of total unicast packets transmitted.

Nonunicast Packets Transmitted:

Show the counting number of both total multicast and broadcast packets transmitted.

3-2-3. Port Configuration

Port Configuration is applied to change the setting of each port. In this configuration function, you can set/reset the following functions, Port State, Auto negotiation, Speed/Duplex, and Flow Control. All of them are described in detail below.

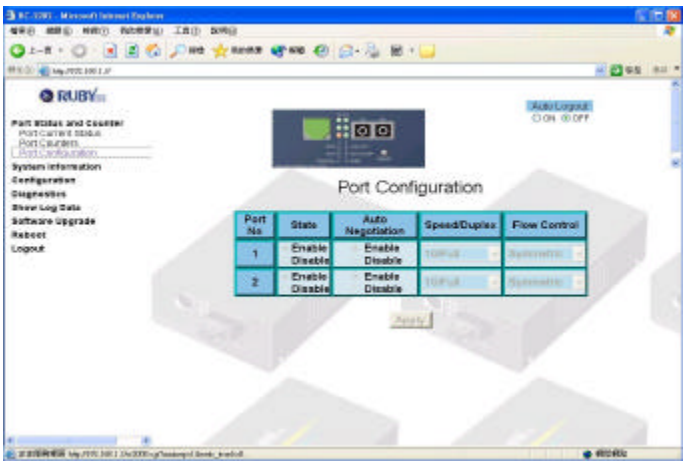


Fig. 3-6 Port Configuration

Function name: Port Configuration

Function description:

It is used to set each port's operation mode. RC-2201/02 supports 4 parameters for each port. They are State, Auto Negotiation, Speed/Duplex, and Flow Control.

Parameter description:

State:

Show if the communication capability of the port is Enabled or Disabled. When enabled, traffic can be transmitted and received via this port. When disabled, the port is blocked and no traffic can be transferred through this port. Port State is configured by the user. There are only two states "Enable" and "Disable" able to be chosen. If you set a port's State "Disable", then that port is prohibited to pass any traffic, even it looks Link up. Default is Enable.

Auto Negotiation:

Only "Enable" and "Disable" two states can be chosen. "Enable" means the port adopted the auto-negotiation algorithm to exchange the capability with the linked partner. When enabled, the speed, duplex mode and flow control mode may change. "Disable" means the forced mode is adopted. When disabled, if you want to set up a connection successfully, you must have both port configuration of local port and linked partner be the same. If their configuration is different, the link will not be set up successfully. In RC-2201/02, the 100Mbps fiber module supports forced mode only; as to the 1Gbps fiber module, it supports auto and forced modes.

Speed / Duplex:

Set the mode of speed and duplex. In speed, 10/100/1000Mbps baud rate is available for port 1, Gigabit baud rate in port 2. If the media is 1Gbps fiber, it is always 1000Mbps and the duplex is full only. If the media is TP, the Speed/Duplex is comprised of the combination of speed mode, 10/100/1000Mbps, and duplex mode, full duplex and half duplex.

Flow Control:

There are three modes to choose in flow control, including Asymmetric, Symmetric and Disable. If Symmetric flow control is set, both parties can send PAUSE frame to the transmitting device(s) while the receiving port is too busy to handle. If Asymmetric flow control is set, this will let the receiving port not care the PAUSE frame from transmitting device(s). This is one-way flow control. When it is set Disable, there will be no flow control in the port. It drops the packet if too much to handle.

Default: Symmetric in full-duplex mode and Backpressure in half duplex.

3-3. Configuration

There are four major configuration function folders, including:

- **System Configuration**
  - Username / Password Setting
  - IP Configuration
  - System Time Setting
  - Power Down Setting
- **Network Management**
  - SNMP Configuration
  - Max. Packet Length Setting
  - Broadcasting Suppression
  - Misc. Feature Configuration
  - **Spanning Tree Configuration**
  - **Filtering Configuration**
- **Trap/Alarm Configuration**
  - Trap Events Configuration
  - Alarm Configuration
- **Save Configuration**
  - Save As User Configuration
  - Restore Default Configuration
  - Restore User Configuration

3-3-1. System Configuration

There are four functions contained in the System Configuration function folder. They are 1) Username/Password Setting, 2) IP Configuration, 3) System Time Setting, and 4) Power Down Setting.

3-3-1-1. Username / Password Setting

In this function, only administrator can create, modify or delete the username and password. Administrator can modify other guest identities' password without confirming the password but it is necessary to modify the administrator-equivalent identity. Guest-equivalent identity can modify his password only. Please note that you must confirm administrator/guest identity on the list box of Authorization in advance before configuring the username and password. The default setting is as follows:

Username : admin

Password : admin

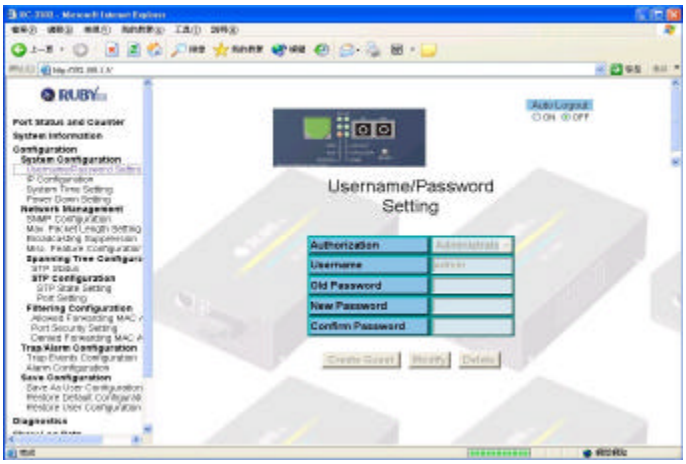


Fig. 3-7 Username/Password Setting

3-3-1-2. IP Configuration

IP configuration is one of the most important configurations in RC-2201/02. Without the proper setting, network manager will not be able to see the device. RC-2201/02 supports both manual IP address setting and automatic IP address setting via DHCP server. When IP address is changed, you must reboot the converter to have the setting taken effect and use the new IP to browse for web management.

Fig. 3-8 Set IP Address

Function name:

IP Configuration

Function description:

Set IP address, subnet mask and default gateway for RC-2201/02.

Parameter description:

DHCP:

RC-2201/02 supports DHCP client used to get an IP address automatically if you set this function "Enable". RC-2201/02 will find the DHCP server existed in the network to get an IP address. If DHCP server is down or does not exist and DHCP in RC-2201/02 is enabled, then RC-2201/02 will count down 60 seconds and use its fixed IP set last time. If set this function "Disable", you have to input IP address manually.

Default: Disable

IP address:

Users can configure the IP settings and fill in new values if users set the DHCP function "Disable". Then, click **<Apply>** button to update.

Default: 192.168.1.1

Subnet mask:

Set the subnet mask value which is the same as that of network it attaches. For more information, please also see the section "IP Address Assignment" in this manual.

Default: 255.255.255.0

Default gateway:

Set an IP address for a gateway to handle those packets that do not meet the rules predefined in a device. If a packet does not meet the criteria for other routers, then it must be sent to a default router. This means any packet with undefined TCP/IP information will be sent to this device unconditionally.

Default: 192.168.1.254

3-3-1-3. System Time Setting

RC-2201/02 provides manual and automatic ways to set the system time via NTP. Manual setting is simple and you just input "Year", "Month", "Day", "Hour", "Minute" and "Second" within the valid value range indicated in each item. If you input an invalid value, for example, 61 in minute, the converter will clamp the figure to 59.

NTP is a well-known protocol used to synchronize the clock of the RC-2201/02 system time over a network. NTP, an Internet draft standard formalized in RFC 1305, has been adopted on the system is version 3 protocol. RC-2201/02 provides four built-in real Internet site NTP server IP addresses and a user-defined NTP server IP address. The time zone is Greenwich-centered which uses the expression form of GMT+/- xx hours.

Function name:

System Time Setting

Function description:

Set the system time manually or get network time from NTP server for system time reference in RC-2201/02.

Parameter description:

Manual:

User can key in Year, Month, Day, Hour, Minute and Second directly to synchronize the system time with local time.

Default : Year = 2000, Month = 1, Day = 1
Hour = 0, Minute = 0, Second = 0

NTP:

Select NTP protocol to synchronize the system time, you only need to choose a NTP server and select a Time Zone. Then, click the **<Apply>** button, the system will take effect immediately. This will not automatically update the system time periodically.

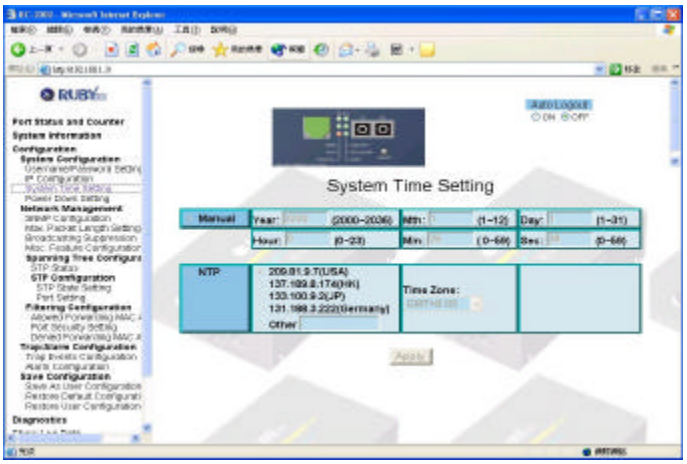


Fig. 3-9 System Time Setting

3-3-1-4. Power Down Setting

With this function, users can choose if users would like RC-2201/02 to power down automatically when the cooling fan stopped, and the temperature is over 60 degree.

Function name:

Power Down Setting

Function description:

RC-2201/02 supports Power Down Setting, and you can enable or disable this function on the web page.

Parameter description:

Enable:

User can enable Power Down Setting, and RC-2201/02 will be shut down automatically when the cooling fan stopped and the temperature is over 60 degree.

Default : Enable

Disable:

RC-2201/02 will not be shut down even when the system temperature is over 60 degree.

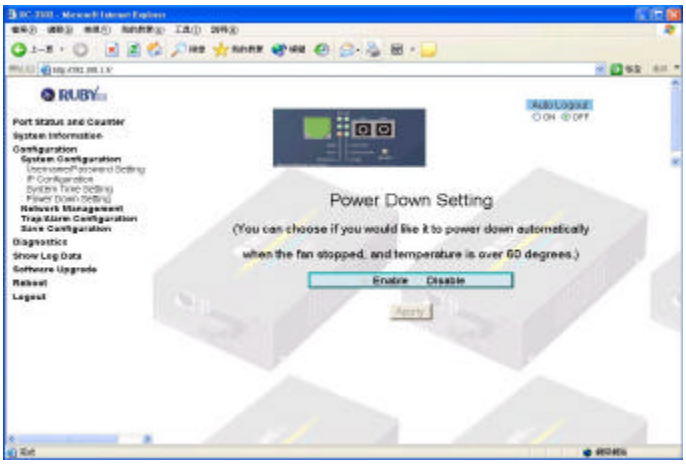

Power Down Setting
(You can choose if you would like it to power down automatically
when the fan stopped, and temperature is over 60 degrees.)
Enable
Disable
Apply

Fig. 3-10 Power Down Setting

3-3-2. Network Management

There are six functions contained in the System Configuration function folder. They are 1) SNMP Configuration, 2) Max. Packet Length Setting, 3) Broadcasting Suppression, 4) Misc. Feature Configuration, 5) Spanning Tree Configuration, and 6) Filtering Configuration.

3-3-2-1. SNMP Configuration

Any Network Management running the Simple Network Management Protocol (SNMP) can manage the Managed Media Converter equipped with SNMP agent, provided that the Management Information Base (MIB) is installed correctly on the management station. The SNMP is a protocol that is used to govern the transfer of information between SNMP manager and agent. The SNMP agent is running on the converter if you set the SNMP "Enable". If the SNMP is set "Disable", the related Community Name, Trap Host IP Address, Trap and RMON counters will be ignored. In the SNMP Configuration function, RC-2201/02 provides:

1) SNMP enable/disable selection. Default is "Enable".

2) User-definable community name for the authentication of GET, SET and TRAP. Community string is used as a password to authenticate the request. If both have the same community name, they can talk each other; otherwise, network management unit cannot access the Managed Media Converter via SNMP protocol. Default community name for SET is "private", and for both GET and TRAP, the default community is "public".

3) 4 trap hosts each with user-definable community name. To set up a trap host means to create a trap manager by assigning an IP address to host the trap message. In other words, the trap host is a network management unit with SNMP manager receiving the trap message from the Managed Media Converter with SNMP agent issuing the trap message. 4 trap hosts can prevent the important trap message from losing.

4) Enable/Disable to issue public trap events. They are cold start trap, warm start trap, link down trap, link up trap and authentication failure trap. As to the enterprise (no.6) trap, which is private trap, is listed in RC-2201/02 MIB file. If all public traps are disabled, no public trap message will be sent. If the trap is enabled, the trap will send to the trap host when a trap happens.

A SNMP manager must pass the authentication, and then it can access the agent. So, both parties must have the same community name. You can also define the system name, system location and contact person for easy management via SNMP manager. Fill in the data, then click **<Apply>** button to apply new settings.

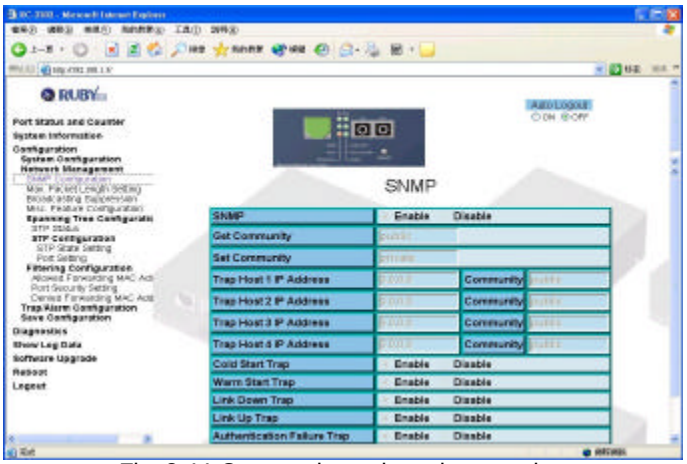


Fig. 3-11 Community and trap host setting

3-3-2-2. Max. Packet Length Setting

RC-2201/02 provides two levels of Ethernet frame size for the user to set up. One is 1536 bytes and the other is 1522 bytes. After selecting one of these two options and then pressing **<Apply>** button, the setting will take effect immediately. Default setting is 1522 bytes long, which can afford accommodating the size of the tagged VLAN frame.

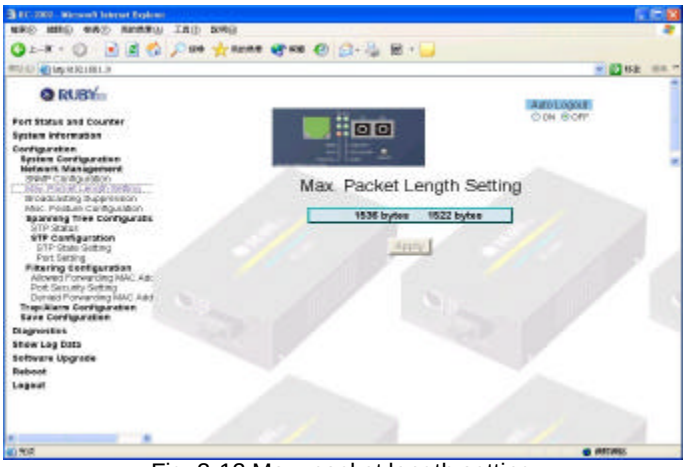


Fig. 3-12 Max. packet length setting

3-3-2-3. Broadcasting Suppression

The Broadcasting Suppression function is used to spread the request broadcast packet into a bigger time frame to prevent the traffic congestion due to broadcast packets from many network devices which may seek its NMS, boot server, DHCP server and many connections predefined when the whole building or block lose the power and then reboot and recover. At this moment, a bunch of converter or other network device on the LAN will try its best to find the server to get the services or try to set up the predefined links, they will issue many broadcast packets in the network.

RC-2201/02 supports a random delay time for DHCP and boot delay for each device. This suppresses the broadcast storm while all devices are at booting stage in the same time. The maximum user-defined delay time is 30 sec. If Broadcasting Suppression function is enabled, the delay time is set randomly, ranging from 0 to 30 seconds, because the exactly delay time is computed by the converter itself. The default is “Disable”.

Fig. 3-13 Broadcast suppression delay setting

3-3-2-4. Misc. Feature Configuration

Miscellaneous Feature Configuration gathers many functions, including MAC Address Aging Time Setting, Broadcast Storm Filter Limit, Priority Queue Service, Max. bridge transmit delay bound control and QoS Policy in one page, which cannot be categorized to some function type. They are described below.

Function Name:

MAC Address Aging Time Setting

Function Description:

This function is used to set the MAC Address Age-out Time applied to the whole MAC address table except some static MAC address. The range of MAC table address entry age-out time is from 30, 33, 36,…765 seconds.

If a source node has not visited the converter for a time longer than the Age-out Time, its responded MAC address information in the converter' s MAC table will be marked invalid by the converter' s aging function. This age-out rule will not be applied to the static MAC addresses.

The default age-out time is 300 seconds.

Function Name:

Broadcast Storm Filter Limit

Function Description:

Broadcast Storm Filter Limit is applied to filter the converter' s broadcast traffic. If you choose an upper threshold, it is enabled. It is a global function. The setting will be applied to all ports of the converter.

The threshold is the percentage of the port's total bandwidth used by broadcast traffic. When broadcast traffic for a port rises above the threshold you set, broadcast storm filter discards the extra broadcast traffic. This keeps the total broadcast traffic less than the threshold able to be forwarded and limits too many broadcast packet running over the network. RC-2201/02 supports five threshold values, which are 5%, 10%, 15%, 20%, and 25%.

Default is OFF.

Function name:

Priority Queue Service

Function Description:

RC-2201/02 provides three priority queue services for transmission scheduling, including FCFS, strict priority and WRR. It is a global function.

First Come First Service (FCFS): All incoming packets will be sent out upon the sequence of packet's arrival order.

All High before Low: After all high priority packets are sent out, then low ones are sent in turn.

Weighted Round Robin (WRR): This is actually a transmission ratio of high priority packet and low priority packet. If you would like to repeatedly send 5 high priority packets first and then 2 low priority packets. You can set a 5 to high weight field and a 2 to low weight field in WRR function row. The WRR Default Setting High = 2, Low = 1

Function name:

Max. bridge transmit delay bound control

Function description:

To set the time that the packets can reside in the queue of the converter.

Parameter description:

Max. bridge transmit delay bound control:

The function "Maximum bridge transmit delay bound control" is applied to limit the maximum queuing time of the packets in the converter. If enabled, the packets queued over the time set will be dropped. Valid values are 1 sec., 2 sec., 4 sec. and OFF. Default value is OFF.

Enable Delay Bound:

Limit the resided time of the low priority packets in the converter. If the low priority packet is not transmitted out and time set by "Delay bound" is enabled, the packet will be dropped. The valid delay time is 1 – 255 ms and OFF.

Default Max. Delay Time is 1ms.

NOTE: Make sure that "Max. bridge transmit delay bound control" is enabled before enabling Delay Bound, because Enable Delay Bound must work under "Max. bridge transmit delay bound control is enabled".

Function name:

QoS Policy

Function Description:

It is used to assign which priority level is high or low. Normally, we map the priority levels 7 – 4 to be high priority and the priority levels 3 – 0 to be low priority. The mapped priority will be applied to the forwarding scheduler. In RC-2201/02, it is FCFS, Strict and WRR. The QoS policy is global.

Default: If enabled, priority levels 7 – 4 are assigned to be high priority, and priority levels 3 – 0 are assigned to be low priority.

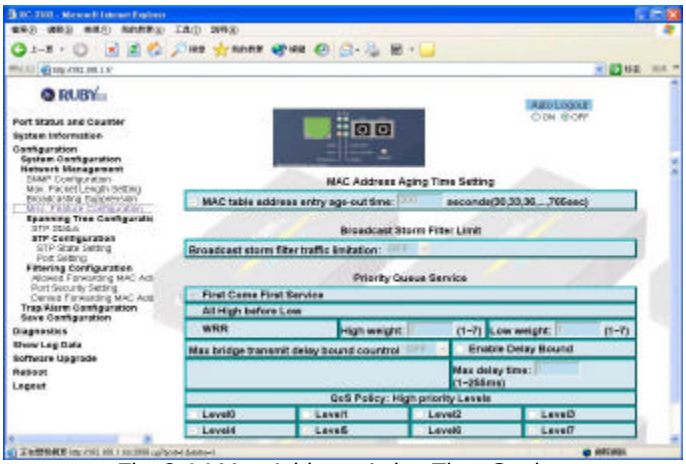


Fig. 3-14 Mac Address Aging Time Setting

3-3-2-5. Spanning Tree Configuration

The Spanning Tree Protocol (STP) is a standardized method (IEEE 802.1D) for avoiding loops in switched networks. When STP is enabled, ensure that only one path is active between any two nodes on the network at a time. User can enable Spanning Tree Protocol on converter's web management and then set up other advanced items. We recommend that you enable STP on all switches and converters to ensure a single active path on the network.

3-3-2-5-1. STP Status

Function name: STP Status

Function description:

In the Spanning Tree Status, user can read 12 parameters to know STP current status. The 12 parameters' description is listed in the following table.

Parameter description:

STP Status:

Show the current STP Enabled / Disabled status. Default is "Disabled".

Bridge ID:

Show converter's bridge ID which stands for the MAC address of this converter.

Bridge Priority:

Show this converter's current bridge priority setting. Default is 32768.

Designated Root:

Show root bridge ID of this network segment. If this converter is a root bridge, the "Designated Root" will show this converter's bridge ID.

Designated Priority:

Show the current root bridge priority.

Root Port:

Show port number connected to the root bridge with the lowest path cost.

Root Path Cost:

Show the path cost between the root port and the designated port of the root bridge.

Current Max. Age (sec):

Show the current root bridge maximum age time. Maximum age time is used to monitor if STP topology needs to change. When a bridge does not receive a hello message from root bridge until the maximum age time is counted down to 0, the bridge will treat the root bridge malfunctioned and issue a Topology Change Notification (TCN) BPDU to all other bridges. All bridges in the LAN will re-learn and determine which the root bridge is. Maximum Age time is assigned by root bridge in unit of seconds. Default is 20 seconds.

Current Forward Delay (sec):

Show the current root bridge forward delay time. The value of Forward Delay time is set by root. The Forward Delay time is defined as the time spent from Listening state moved to Learning state or from Learning state moved to Forwarding state of a port in bridge.

Hello Time (sec):

Show the current hello time of the root bridge. Hello time is a time interval specified by root bridge, used to request all other bridges periodically sending hello message every "hello time" seconds to the bridge attached to its designated port.

STP Topology Change Count:

STP Topology Change Count expresses the time spent in unit of seconds since the beginning of the Spanning Tree Topology Change to the end of the STP convergence. Once the STP change is converged, the Topology Change count will be reset to 0. The figures showing in the screen may not be the exact time it spent but very close to, because the time is eclipsing.

Time Since Last Topology Change (sec):

Time Since Last Topology Change is the accumulated time in unit of seconds the STP has been since the last STP Topology Change was made. When Topology Change is initiated again, this counter will be reset to 0 And it will also count again once STP topology Change is completed.

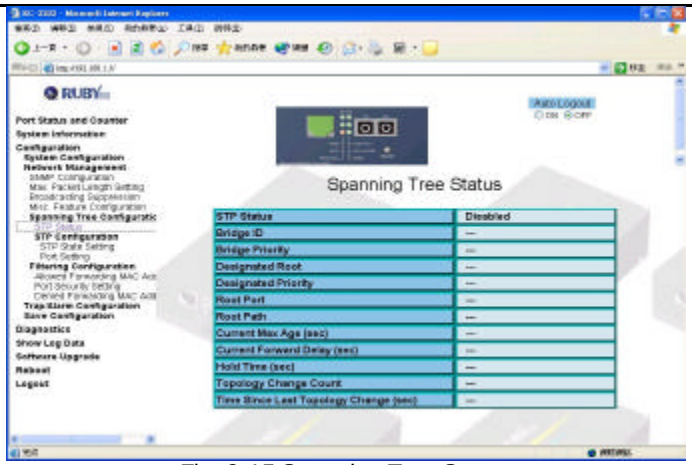


Fig. 3-15 Spanning Tree Status

3-3-2-5-2. STP Configuration

The STP, Spanning Tree Protocol, actually includes RSTP. In the Spanning Tree Configuration, there are six parameters open for the user to configure as user' s idea. Each parameter description is listed below.

Function name:

STP State Setting

Function description:

User can set the following Spanning Tree parameters to control STP function enable/disable, select mode RSTP/STP and affect STP state machine behavior to send BPDU in this converter. The default setting of Spanning Tree Protocol is "Disable".

Parameter description:

Spanning Tree Protocol:

Set 802.1W Rapid STP function Enable / Disable. Default is "Disable"

Bridge Priority:

The lower the bridge priority value is, the higher priority it has. Usually, the bridge with the highest bridge priority is the root. If you want to have RC-2201/02 as root bridge, you can set this value lower than that of bridge in the LAN. The valid value is 0 ~ 61440. The default is 32768.

Hello Time:

Hello Time is used to determine the periodic time to send normal BPDU from designated ports among bridges. It decides how long a bridge should send this message to other bridge to tell I am alive. When RC-2201/02 is the root bridge of the LAN, for example, all other bridges will use the hello time assigned by RC-2201/02 to communicate with each other. The valid value is 1 ~ 10 in unit of second.

Default is 2 seconds.

Max. Age:

When RC-2201/02 is the root bridge, the whole LAN will apply this figure

set by RC-2201/02 as their maximum age time. When a bridge received a BPDU originated from the root bridge and if the message age conveyed in the BPDU exceeds the Max. Age of the root bridge, the bridge will treat the root bridge malfunctioned and issue a Topology Change Notification (TCN) BPDU to all other bridges. All bridges in the LAN will re-calculate and determine who the root bridge is. The valid value of Max. Age is 6 ~ 40 seconds. Default is 20 seconds.

Forward Delay:

You can set the root bridge forward delay time. This figure is set by root bridge only. The forward delay time is defined as the time spent from Listening state moved to Learning state and also from Learning state moved to Forwarding state of a port in bridge. The forward delay time contains two states, Listening state to Learning state and Learning state to Forwarding state. It assumes that forward delay time is 15 seconds, then total forward delay time will be 30 seconds. This has much to do with the STP convergent time which will be more than 30 seconds because some other factors.

The valid value is 4 ~ 30 seconds, default is 15 seconds.

Force Version:

Two options are offered for the user's choosing STP algorithm. One is RSTP and the other is STP. If STP is chosen, RSTP will run as a legacy STP. RC-2201/02 supports RSTP (802.1w) which is backward compatible with STP (802.1d).

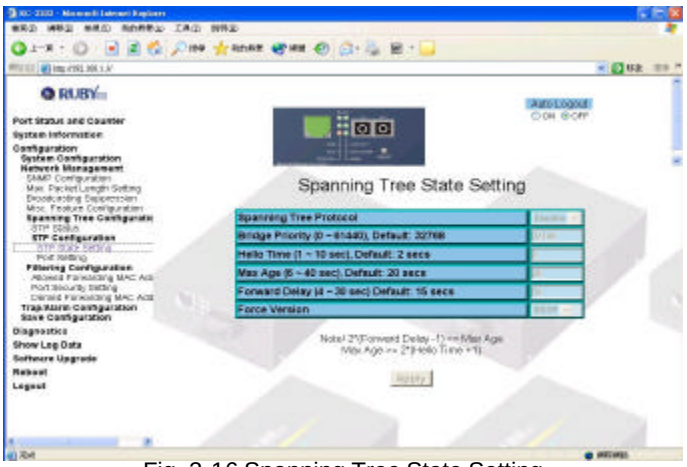


Fig. 3-16 Spanning Tree State Setting

Function name:

Port Setting

Function description:

In the STP Port Setting, one item selection and five parameters settings are offered for user's setup. User can disable and enable each port by selecting each Port Status item. User also can set "Path Cost" and "Priority" of each port by filling in the desired value and set "Admin Edge Port" and "Admin Point To Point" by selecting the desired item.

Parameter description:

Port Status:

It displays the current state of a port. We cannot manually set it because it displays the status only. There are three possible states. (according to 802.1w specification)

DISCARDING state indicates that this port can neither forward packets nor contribute learning knowledge.

Notice: Three other states (Disable state, BLOCKING state and LISTENING state) defined in the 802.1d specification are now all represented as DISCARDING state.

LEARNING state indicates this port can now contribute its learning knowledge but cannot forward packets still.

FORWARDING state indicates this port can both contribute its learning knowledge and forward packets normally.

Path Costs:

The contribution value of the path through this port to Root Bridge. STP algorithm determines a best path to Root Bridge by calculating the sum of path cost contributed by all ports on this path. A port with a smaller path cost value would become the Root Port more possibly. The range is 0 – 200,000,000. In RC-2201/02, path cost with 0 value means automatic which will automatically assign the path cost value defined by IEEE 802.1w.

Default: 128

802.1w RSTP recommended value: (Valid range: 1 – 200,000,000)

10 Mbps : 2,000,000

100 Mbps : 200,000

1 Gbps : 20,000

Priority:

Priority here means Port Priority. Port Priority and Port Number are mixed to form the Port ID. Port IDs are often compared in order to determine which port of a bridge would become the Root Port. The range is 0 – 240.

Default is 128.

Admin Edge Port:

If user selects “Yes”, this port will be an edge port. An Edge Port is a port connected to a device that knows nothing about STP or RSTP. Usually, the connected device is an end station. Edge Ports will immediately transit to forwarding state. User can select “Yes” or “No”.

Default: No

Admin Point To Point:

We say a port is on a point-to-point link if the port is in full-duplex mode. RSTP fast convergence can only happen on a point-to-point link. To determine if this port is on a point-to-point link is by auto-detecting the port’s duplex mode if the parameter is set to “Auto”. If the parameter is set “True”, the port is unconditionally considered to be on a point-to-point link. If the parameter is set to “False”, fast transition to Forwarding state

will not happen on this port. User can select “Auto”, “True” or “False”.

Default : Auto

M Check:

Migration Check. It forces the port sending out an RSTP BPDU instead of a legacy STP BPDU at the next transmission. The only benefit of this operation is to make the port quickly get back to act as an RSTP port. Click **<M Check>** button to send a RSTP BPDU from the port you specified.

Fig. 3-17 Spanning Tree Port Setting

3-3-2-6. Filtering Configuration

The filtering function in RC-2201/02 is used to filter unwanted MAC address from accessing the converter based on some simple rules. RC-2201/02 provides three types of filtering function for security configuration. They are Allowed Forwarding MAC Address, Port Security Setting and Denied Forwarding MAC Address. You can configure it for different purposes of application. Here we list two examples for your reference.

Example 1:

Assumes administrator wishes a specified station can only access the converter from a specified port and the traffic from all other stations is rejected by that specified port. How should we configure RC-2201/02 for the case?

Solution:

First, enter the function “Allowed Forwarding MAC Address” to add an entry with the MAC address of the specified station on the Allowed Forwarding table of the specified port. The Security Port of the specified port should be then enabled in the “Port Security Setting” function. Finishing this process, the specified port will not allow any other station to access the converter except the specified station. And if this specified station is moved to other port, it cannot access the converter, either.

Example 2:

Assumes an administrator wishes to deny a specified station from accessing the converter, which is to isolate the specified station from the converter. How should we configure RC-2201/02 for the case?

Solution:

For denying a specified station, it is easy. You just have to use the function "Denied Forwarding MAC Address" to configure it. Enter this function and press the **<Add>** button to add the MAC address of the specified station, which is rejected to access the converter. The Deny Forwarding function is global. It is applied to the whole converter.

Function name:

Allowed Forwarding MAC Address

Function description:

Allowed Forwarding MAC Address is a function to allow the user in the Allowed Forwarding table to access a specified port of the converter. Allowed Forwarding table associated with a specified port of a cobverter is setup by manually inputting MAC address and its alias name. The data in the table is kept until RC-2201/02 is powered off. The traffic with the source MAC address listed in the Allowed Forwarding Table can only access the converter from the port associated. The MAC address associated with the specified port cannot access any other port of the converter. All of the above settings will take effect only when "Port Security Setting" function of the associated port is enabled.

For adding a MAC address entry in the allowed table, you just need to fill in four parameters: MAC address, associated port, and priority. Just select the MAC address entry you want and click **the <Delete>** button, then you can also remove it.

Parameter description:

Allowed Forwarding table:

A table stored MAC address entry with associated port number and priority, is used to provide the function to allow the users listed in this table to access the associated port of the converter.

MAC Address:

It is a six-byte long Ethernet hardware address and usually expressed by hex and separated by hyphens. For example,

00 – 40 - C7 - D6 – 00 - 01

Port:

Port number of RC-2201/02. It is 1 or 2.

Priority:

This is for traffic priority. User can configure a MAC address high priority or low priority. If MAC address is configured high priority, the packet with that DA or SA will be put into the high priority queue and be transmitted with high priority. If MAC address is configured low priority, the packet with that MAC address will be transmitted with low priority.

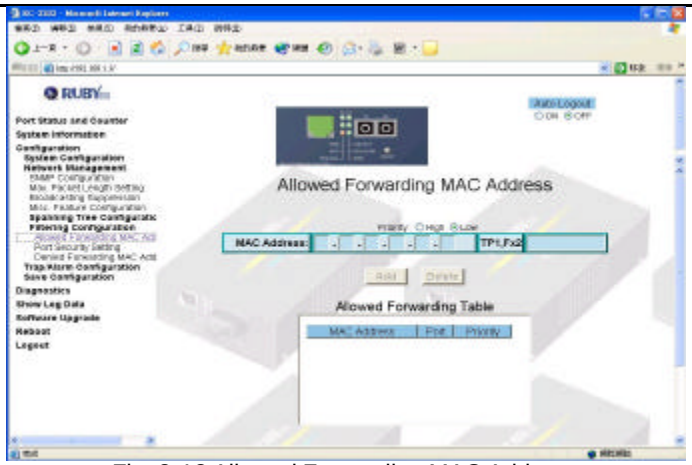


Fig. 3-18 Allowed Forwarding MAC Address

Function name:

Port Security Setting

Function description:

The usage of Port Security has to combine with Allowed Forwarding MAC Address function as mentioned above. In this function, you can enable it if you select the port. If the user ticks each port, then, the ticked port will stop learning MAC Address and block any incoming packet except that the packet with the MAC Address is listed in the Forwarding MAC Address table associated with that port. The **<Apply>** button is for user to click to let the system take effect immediately.

Fig. 3-19 Port Security Setting

Function name:

Denied Forwarding MAC Address

Function description:

Denied Forwarding MAC Address is a function that denies the packet forwarding if the packet' s MAC Address is listed in the filtering MAC Address table. User can very easily maintain the table by filling in MAC Address. User

also can insert or delete each entry by clicking **<Add>** or **<Delete>** button.

Parameter description:

Denied Forwarding Table:

A table stored MAC address entry that used to reject the users listed in this table to access the converter.

MAC Address:

It is a six-byte long Ethernet hardware address and usually expressed by hex and separated by hyphens. For example,

00 – 40 - C7 - D6 – 00 - 01

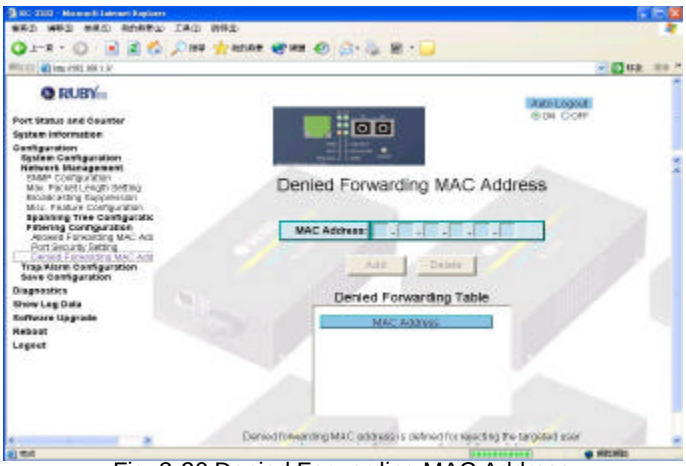


Fig. 3-20 Denied Forwarding MAC Address

3-3-3. Trap/Alarm Configuration

Function name:

Trap Events Configuration

Function description:

The Trap Events Configuration function is used to enable the Managed Media Converter to send out the trap information while pre-defined trap events occurred.

RC-2201/02 offers 16 different trap events to users for management. The trap information can be sent out in three ways, including e-mail, mobile phone SMS (short message system) and Trap. The message will be sent while users tick (☑) the trap event individually on the web page shown as below.

Parameter description:

The traps RC-2201/02 supports are listed below.

STP: STP Topology Change, STP Disabled, STP Enabled

Temperature: Temperature Over/Under, Temperature Normal

Case: Case Opened, Case Closed

Flash: Flash Write Fail

FAN: FAN Down, FAN Working, Fan/Temperature Fail

Start: Cold Start, Warm Start

Link: Link Down, Link Up

Authentication Failure

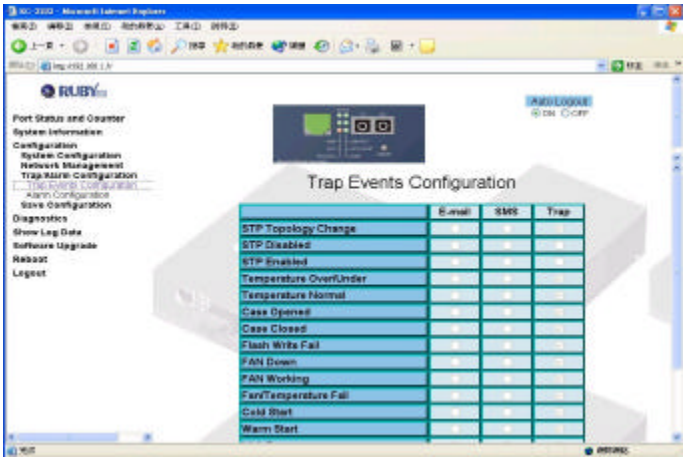


Fig. 3-21 Trap Events Configuration

Function name:

Alarm Configuration

Function description:

Alarm configuration is used to configure the persons who should receive the alarm message via either email or SMS, or both. It depends on your settings. An email address or a mobile phone number has to be set in the web page of alarm configuration (See Fig. 3-22). Then, user can read the trap information from the email or the mobile phone. This function provides 6 email addresses and 6 mobile phone numbers at most. The 16 different trap events will be sent out to SNMP Manager when trap event occurs. After ticking trap events, you can fill in your desired email addresses and mobile phone numbers. Then, please click **<Apply>** button to complete the alarm configuration. It will take effect in a few seconds.

Note: SMS may not work in your mobile phone system. It is customized for different systems.

Parameter description:

Email:

Mail Server: the IP address of the server transferring your email.

Username: your username on the mail server.

Password: your password on the mail server.

Email Address 1 – 6: email address that would like to receive the alarm message.

SMS:

Username: your username in ISP.

Password: your password in ISP.

Mobile Phone 1-6: the mobile phone number that would like to receive the alarm message.

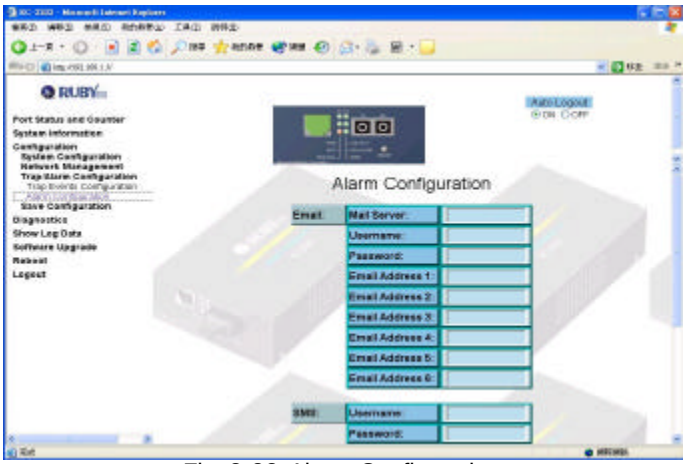


Fig. 3-22 Alarm Configuration

3-3-4. Save Configuration

RC-2201/02 supports three copies of configuration, including default configuration, working configuration and user configuration for your configuration management. All of them are listed and described below respectively.

- **Default Configuration:**

  This is the ex-factory setting and cannot be altered.

- **Working Configuration:**

  It is the configuration you are using currently and can be changed any time. The configurations you are using are saved into this configuration file. This is updated each time as you press **<Apply>** button.

- **User Configuration:**

  It is the configuration file for the specified or backup purposes and can be updated while having confirmed the configuration. You can retrieve it by performing Restore User Configuration.

Function name:

Save As User Configuration

Function description:

Save As User Configuration function can save the current configuration as a user configuration file in flash memory.

Fig. 3-23 Save As User Configuration

Function name:

Restore Default Configuration

Function description:

Restore Default Configuration function can retrieve the Ruby's setting to replace the working configuration.

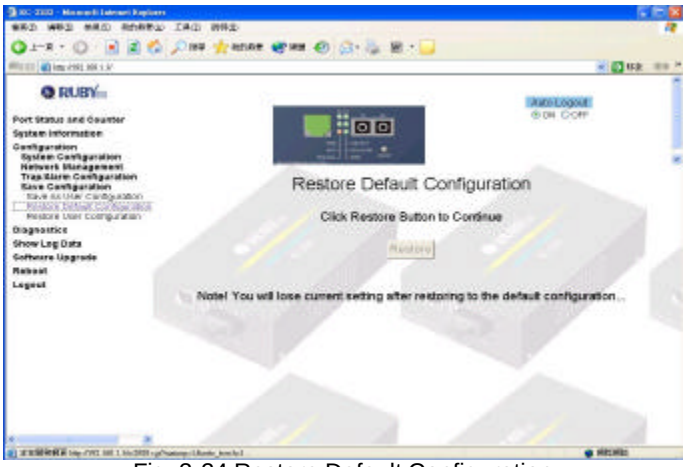

Restore Default Configuration
Click Restore Button to Continue
Note! You will lose current setting after restoring to the default configuration...

Fig. 3-24 Restore Default Configuration

Function name:

Restore User Configuration

Function description:

Restore User Configuration function can retrieve the previous confirmed working configuration stored in the flash memory to update user's current working configuration. When completing to restore the configuration, the system's working configuration is updated and will be changed its working mode by the new configuration immediately.

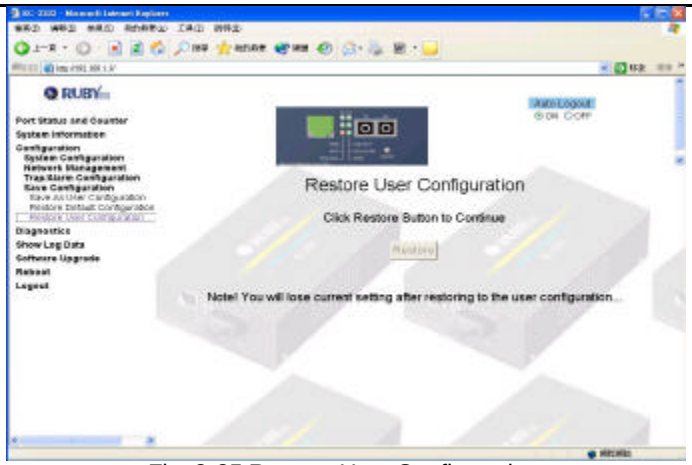


Fig. 3-25 Restore User Configuration

3-4. Diagnostics

Function name:

Diagnostics

Function description:

Diagnostics function provides a set of basic system diagnosis. It let users know that whether the system is health or needs to be fixed. The basic system check includes UART test, DRAM test, Flash test, Temperature detection, Case detection and Fan RPM detection.

Fig. 3-26 Diagnostics

Function name:

Loopback Test

Function description:

In the Loopback Test function, there are two different loopback tests. One is Internal Loopback Test and the other is External Loopback Test. The former test function will not send the test signal outside the RC-2201/02. The test signal only wraps around in the RC-2201/02. As to the latter test function, it will send the test signal to its link partner. If you do not have them connected to active network devices, i.e. the ports are link down, RC-2201/02 will report the port numbers failed. If they all are ok, it just shows OK.

Note: Whatever you choose Internal Loopback Test or External Loopback Test, these two functions will interfere with the normal system working, and all packets in sending and receiving also will stop temporarily.

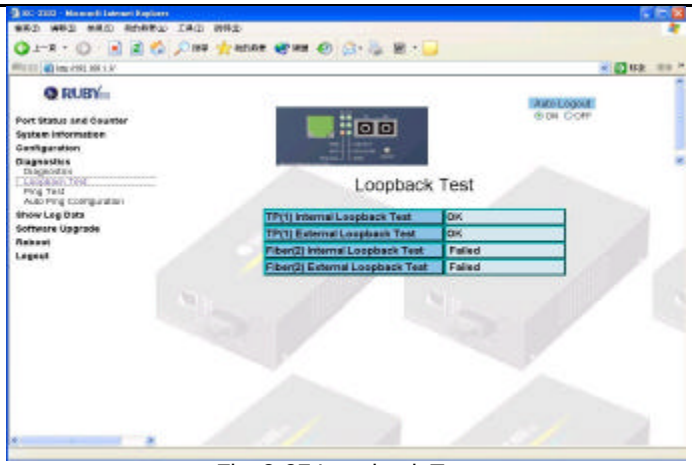


Fig. 3-27 Loopback Test

Function name:

Ping Test

Function description:

Ping Test function is a tool for detecting if the target device is alive or not through ICMP protocol which abounds with report messages. RC-2201/02 provides Ping Test function to let you know that if the target device is available or not. You can simply fill in a known IP address and then click **<Ping Now>** button. After a few seconds later, RC-2201/02 will report you the pinged device is alive or dead.

Parameter description:

IP Address: an IP address with the version of v4, e.g. 192.168.1. 254.

Default Gateway: IP address of the default gateway.

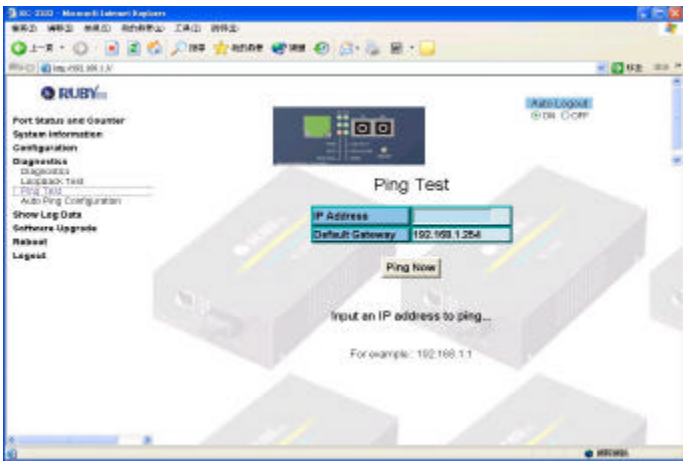


Fig. 3-28 Ping Test

Function name:

Auto Ping Configuration

Function description:

Auto Ping Configuration is used to test one or two target devices periodically with a period of time, which is programmable. This can detect that if the target device or the device itself is dead, and it helps you debug the network problems. RC-2201/02 can auto-ping two network devices at the same time.

Parameter description:

Ping Interval:

This parameter is used to instruct RC-2201/02 periodically pinging the target device with the time interval you assigned. Programmable time range: 1 – 60 minutes. Default: 10 minutes.

Host IP Address 1/2 and Current Default Gateway:

These are IP addresses with the format of version 4.

Fig. 3-29 Auto Ping Configuration

3-5. Show Log Data

This function shows the log data. RC-2201/02 provides three types of log data for users, including trap log, illegal access log and MAC Alias, in which illegal access log is reported in the Illegal Access Report. RC-2201/02 supports total 60 log entries. For more details on log items, please refer to the section of Trap/Alarm Configuration and SNMP Configuration. User logs include user login and logout.

Function name:

Trap Log Data

Function description:

The Trap Log Data is displaying the log items including all SNMP Private Trap events, SNMP Public traps and user logs occurred in the system. In the report table, No., Time and Events are three fields contained in each trap record.

Parameter description:

No:

Display the order number that the trap happened.

Time:

Display the time that the trap happened.

Events:

Display the trap event name.

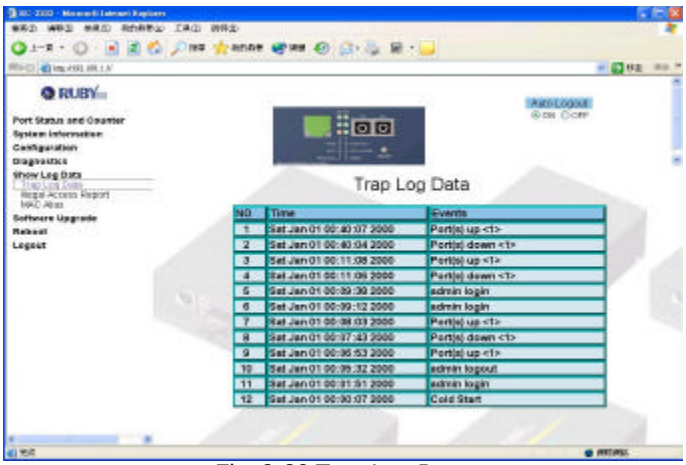


Fig. 3-30 Trap Log Data

Function name:

Illegal Access Report

Function description:

The Illegal Access Report function is to display the unauthorized users accessing RC-2201/02. If Allowed forwarding or Denied forwarding was configured, Illegal Access Report starts recording which illegal user(s) try to access. At this moment, illegal users will be rejected to serve in RC-2201/02.

This can highly improve network security and traffic management.

In this table, RC-2201/02 records those users who violate Allowed Forwarding rule and Denied Forwarding rule. Besides, illegal access report can also show the alias name of users, instead of MAC address only, if you configured MAC alias name in advance.

Each entry in illegal access report comprises six fields, including record order number, Source Address, Destination Address, port number, time and type. RC-201/02 supports 32 record entries for illegal access report by applying ring structure. That means if there is no room for the new record, it will overwrite the oldest record in the ring.

Parameter description:

*No.: Display t*he order number that the trap happened.

Source Address: MAC Source Address.

Dest. Address: MAC Destination Address.

*Port: Display the p*ort number that the illegal access happened.

Time: Current System Time.

Type: Violating Allowed Table or Violating Denied Table.

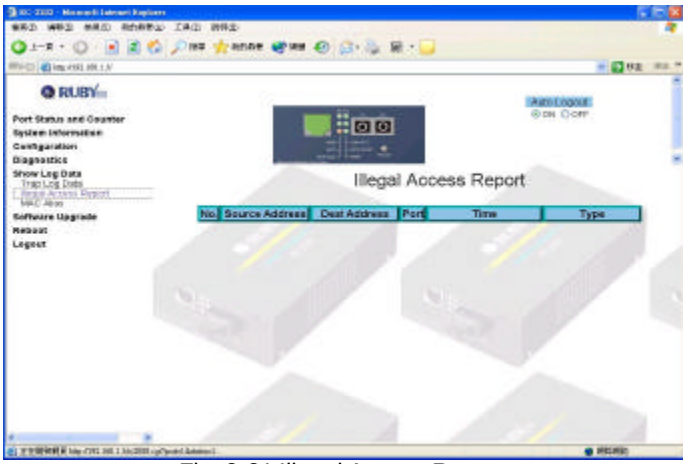


Fig. 3-31 Illegal Access Report

Function name:

MAC Alias

Function description:

MAC Alias function is used to let you assign MAC address a plain English name, which will help you tell which MAC address belongs to which user in the illegal access report. At the initial time, it shows all pairs of the existed alias name and MAC address.

There are three MAC alias functions in this function folder, including MAC Alias Add, MAC Alias Edit and MAC Alias Delete. You can click **<Create>** button to add a new alias name for a specified MAC address, or mark an existed entry to edit/delete it. Alias name must be composed of A-Z, a-z and 0-9 only and has a maximal length of 17 characters.

Fig. 3-32 MAC Alias

Function name:

MAC Alias Add

Function description:

In the MAC Alias function, it is used to let you add an association between MAC address and a plain English name. User can click **<Create>** button to add a new record with name.

Parameter description:

MAC Address:

New Entry:

If you want to apply a name to a MAC address which does not exist in the MAC address table, you must choose New Entry to fill in the MAC address by yourself or select a MAC address in the pull-down menu by pressing the **<Downward>** arrow key. You can also select one of the MAC addresses in the list, and then assign it an alias name for mnemonic name.

MAC Alias:

MAC alias name you assign.

Note: If there are too many MAC addresses learned in the table, we recommend you inputting the MAC address and alias name directly.

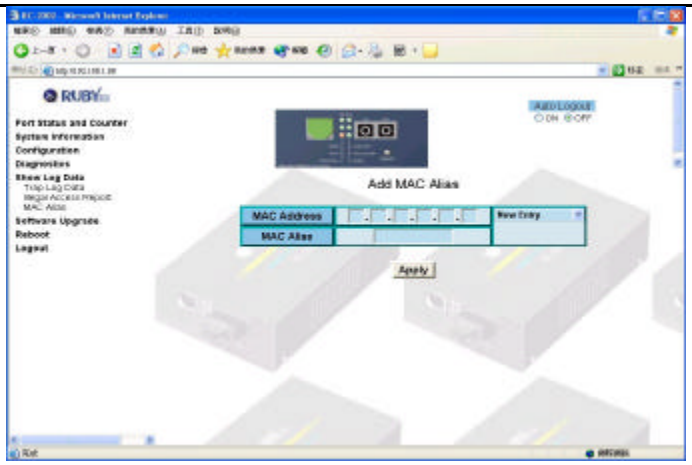


Fig. 3-33 Add MAC Alias

Function name:

MAC Alias Edit/Delete

Function description:

MAC Alias Edit/Delete function is used to let you modify/remove an alias name to a MAC address. You can select an existed MAC address or alias name to modify/remove.

Parameter description:

MAC Address:

The Ethernet MAC address of end station.

MAC Alias:

A mnemonic name for the end station.

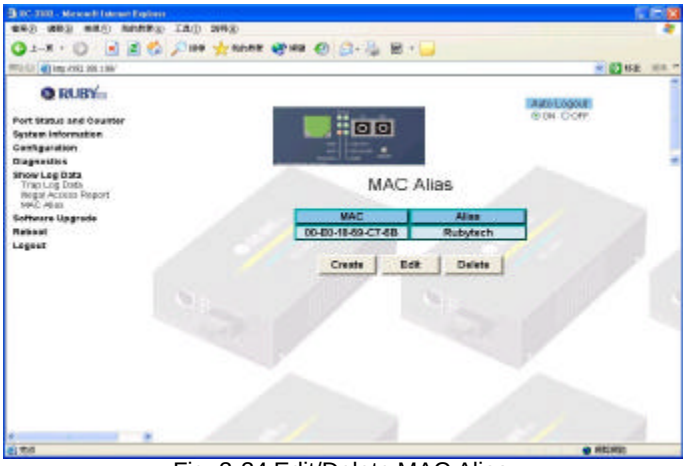


Fig. 3-34 Edit/Delete MAC Alias

3-6. Software Upgrade

Software upgrade tool is used to help upgrade the software function in order to fix or improve the function. RC-2201/02 provides a TFTP client for software upgrade. This can be done through Ethernet.

Function name:

Software Upgrade

Function description:

RC-2201/02 supports TFTP upgrade tool for upgrading software. If you assure to upgrade software to a newer version one, you must follow two procedures:

1.) Specifying the IP address where TFTP server locates. In this field, the IP address of your TFTP server should be filled in.

2.) Specifying what is the filename and where is the file. You must specify full path and filename.

Once you press **<Apply>** button, RC-2201/02 will prompt the screen for you to reconfirm. Then, RC-2201/02 starts downloading software from TFTP server if you choose **<OK>** button. It will be just back to "Software Upgrade" if you choose **<Cancel>** button.

If your download is not successful, RC-2201/02 will also be back to "Software Upgrade", and it will not upgrade the software as well.

When download is completed, RC-2201/02 starts upgrading software. A reboot message will be prompted after completing upgrading software. At this time, you must reboot RC-2201/02 to have new software worked.

Note: Software upgrade is hazardous if power is off. You must do it carefully.

Parameter description:

TFTP Server:

A TFTP server stored the image file you want to upgrade.

Path and Filename:

File path and filename stored the image file you want to upgrade.

Fig. 3-35 Software Upgrade

3-7. Reboot

We offer you many ways to reboot RC-2201/02, including power up, hardware reset and software reset. You can press the RESET button in the front panel to reset RC-2201/02. After upgrading software or changing IP configuration, then you must reboot to have the new configuration taken effect. Here we are discussing is software reset for the "reboot" in the main menu.

Function name:

Reboot

Function description:

Reboot RC-22201/02. Reboot takes the same effect as the RESET button on the front panel of RC-2201/02 Converter. It will take around thirty (30) seconds to complete the system boot.

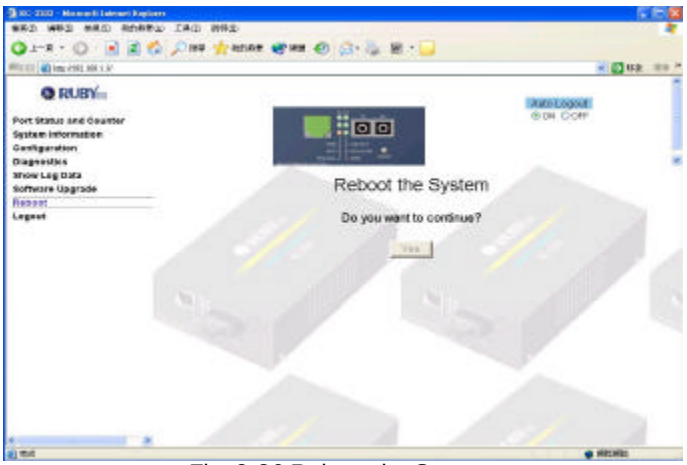


Fig. 3-36 Reboot the System

3-8. Logout

You can manually logout by performing Logout function. In RC-2201/02, it provides another way to logout. You can configure it to logout automatically.

Function name:

Logout

Function description:

RC-2201/02 allows you to logout the system to prevent other users from the system without the permission. If you do not logout and exit the browser, RC-2201/02 will automatically have you logout. Besides this manually logout and implicit logout, you can click **<Auto Logout>** radian at the right-top corner to explicitly ON/OFF this logout function.

Parameter description:

Auto Logout:

Select On/OFF. Default is ON. If it is "ON", and no action and no key is stroke as well in any function screen more than 3 minutes, RC-2201/02 will have you logout automatically.

Fig. 3-37 Logout

4. Operation of Menu-driven Console

1. The RC-2201/02 Managed Media Converter also provides a text-based menu-driven console by RS-232 terminal or Ethernet Port (telnet) to manage and monitor the port activity. Usually, in order to have the device connected to the management station, the console is used to change the settings such as IP address for the first time.

   Now, you can use the console to modify the IP setting through telnet program.

   The default values of RC-2201/02 Converter are as follows:

IP Address	:192.168.1.1
Subnet Mask	:255.255.255.0
Default Gateway	:192.168.1.254
Username	:admin
Password	:admin

2. For instance, you can run telnet 192.168.1.1 in Windows 95/98/2000/XP…, and so on, then enter the username and password as above. The screen is shown as follows:

   Username: your account name

   Password: your password

   Only administrator is allowed to add, delete or modify user account.

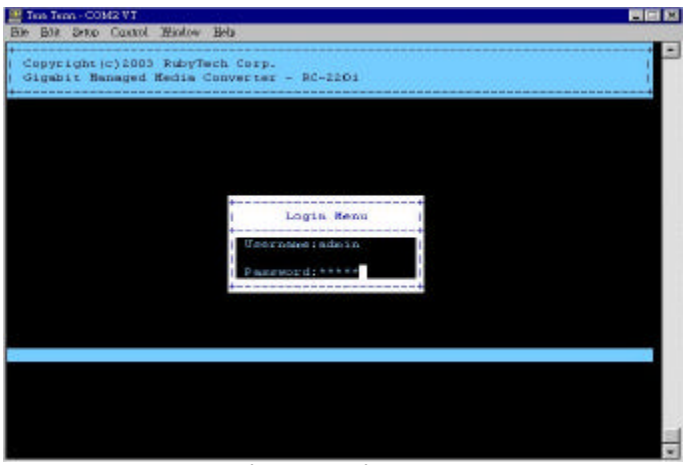


Fig. 4-1 Login Menu

4-1. Text-based Menu-driven Management Overview

The text-based Main Menu will be shown up after you fill in "admin" to serve as username as well as password and press the **<Enter>** key. On the menu, user can use arrow keys to move cursor to each item and press the **<Enter>** key to select the item you would like. The **<Esc>** key is used to escape to the upper menu page layer. The main functions will be listed in the middle of the console. The main functions contain "Port Status and Counter", "System Information", "Configuration", "Diagnostics", "Show Log Data", "Software Upgrade", "Reboot" and "Logout". The details of the main functions will be introduced in the following sections.

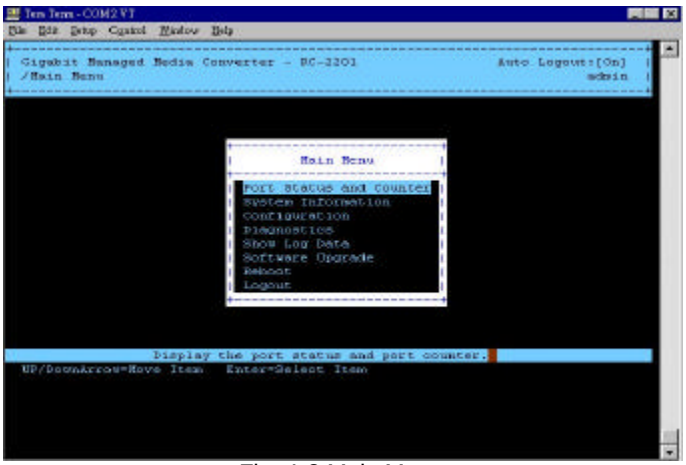


Fig. 4-2 Main Menu

As shown in Fig.4-3, the System Information includes "Model Name", "System Description" , "Location" , "Contact" , "System Up Time" , "Current Time" , "MAC Address" , "BIOS Version" , "Firmware Version" , "Hardware-Mechanical Version", "RAM Size", "Flash Size", "Temperature", "IP Address", "Series Number", "Device Port", "Case Detection", and "Fiber Port".

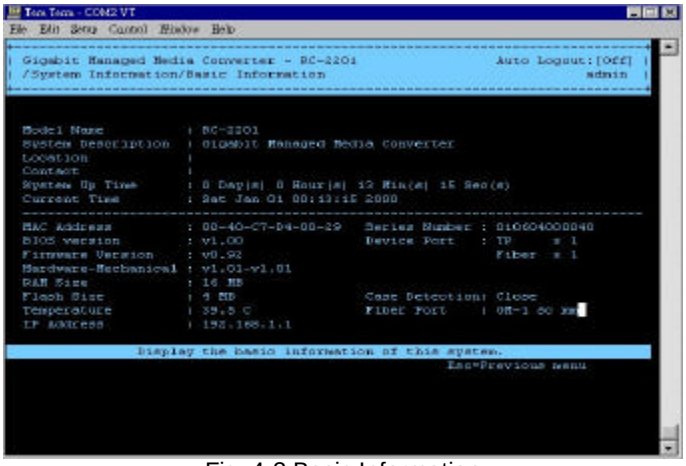

Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/System Information/Basic Information
admin
Model Name : RC-2201
System Description : Gigabit Managed Media Converter
Location :
Contact :
System Up Time : 0 Day(s) 0 Hour(s) 12 Min(s) 15 Sec(s)
Current Time : Sat Jan 01 00:12:15 2000
MAC Address : 00-40-C7-D4-00-29
Series Number : 010604000040
BIOS version : v1.00
Device Port : TP x 1
Firmware Version : v0.92
Fiber x 1
Hardware-Mechanical : v1.01-v1.01
RAM Size : 16 MB
Flash Size : 4 MB
Case Detection: Close
Temperature : 39.0 C
Fiber Port : 0M-1 60 xx
IP Address : 192.168.1.1
Display the basic information of this system.
Esc=Previous menu

Fig. 4-3 Basic Information

Function name:

System Information

Function description:

Show the basic system information.

Parameter description:

Model Name:

The model name of this product.

System Description:

Gigabit Managed Media Converter

Location:

Basically, it is the location where this converter is put. User-defined.

Contact:

User can configure this parameter via SNMP Set. It belongs to string format.

System Up Time:

The time accumulated since this converter is powered up. Its format is day, hour, minute, second.

Current Time:

Show the system time of RC-2201/02. Its format: day of week, month, day, hours : minutes : seconds, year. For instance, Wed, Apr. 23, 12:10:10, 2003.

MAC Address:

It is the MAC address of the management agent in this converter.

BIOS Version:

The version of the BIOS in this converter.

Firmware Version:

The firmware version in this converter.

Hardware-Mechanical Version:

The version of Hardware and Mechanical. The figure before the hyphen is the version of electronic hardware; after the hyphen is the version of mechanical.

RAM Size:

The size of the DRAM in this converter.

Flash Size:

The size of the flash memory in this converter.

System Temperature:

The air temperature inside of this converter.

Series Number:

The serial number is assigned by Rubytech.

Device Port:

Show all types and numbers of the port in RC-2201/02.

Case Detection:

Show the status of the upper case of this converter. When the case is lid off, it shows "Open"; otherwise, it shows "Close".

Fiber Port:

Show the media type of the fiber port, for instance, SC MM, ST MM, SC SM….

4-2. Port Status and Counter

Three functions, including "Port Current Status", "Port Counters" and "Port Configuration" are contained in this function folder for port monitoring and management. Each of them will be described in detail orderly in the following sections.

4-2-1.Port Current Status

The function Port Current Status gathers the information of all ports' current status and reports it by the order of port number, Link status, Port state, Auto-Negotiation status, Speed/Duplex, and Flow control.

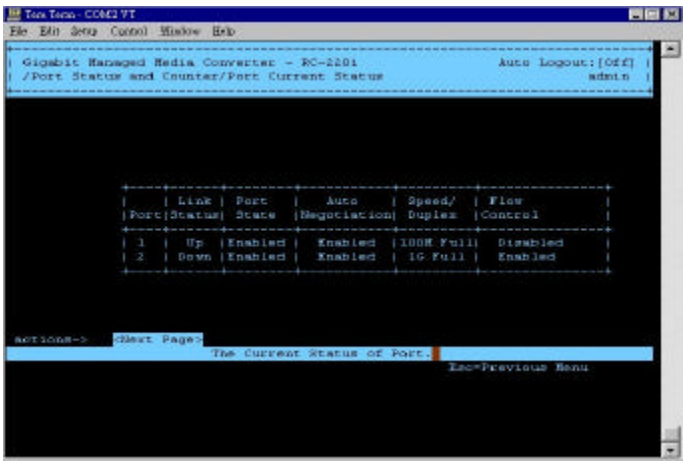

Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/Port Status and Counter/Port Current Status
admin
Port | Link Status | Port State | Auto Negotiation | Speed/ Duplex | Flow Control
1 | Up | Enabled | Enabled | 100M Full | Disabled
2 | Down | Enabled | Enabled | 1G Full | Enabled
<Next Page>
The Current Status of Port.
Esc=Previous Menu

Fig. 4-4 Port Current status

Function name:

Port Current Status

Function Description:

Report the latest updated status of all ports in this converter. When any one of the ports in RC-2201/02 changes its parameter displayed in the page, it will be automatically refreshed the port current status about every 5 seconds.

Parameter Description:

Port:

Display the port number. The number is 1 and 2.

Link Status:

Show that if the link on the port is active or not. If the link is connected to a working-well device, the Link will show the link "Up"; otherwise, it will show "Down". This is determined by the negotiation of hardware.

Port State:

Show that the communication capability of the port is "Enabled" or "Disabled". When it is enabled, traffic can be transmitted and received via this port. When it is disabled, no traffic can be transferred through this port. Port State is configured by user. Default is Enabled.

Auto Negotiation:

Show the exchange mode of Ethernet MAC. There are two modes supported in RC-2201/02. They are auto-negotiation mode "Enabled" and forced mode "Disabled". When in "Enabled" mode, this function will automatically negotiate by hardware itself and exchange each other the capability of speed and duplex mode with other site which is linked, and comes out the best communication way. When in "Disabled" mode, both parties must have the same setting of speed and duplex, otherwise, both of them will not be linked. In this case, the link status is "Down".

Default: Enabled mode

Speed / Duplex:

Display the speed and duplex of all port. There are three speeds 10Mbps, 100Mbps and 1000Mbps supported in RC-2201/02. The duplex supported is half duplex and full duplex. The status of speed/duplex mode is determined by 1) the negotiation of both local port and link partner in "Enabled" mode or 2) user setting in "Disabled" mode. The local port has to be preset its capability.

In port 1, it is supported 10/100/1000Mbps with TP media, so the result will show 10Mbps/Full duplex and 10Mbps/Half duplex, 100Mbps/Full duplex or 100Mbps/Half duplex, and 1G/Full.

In port 2, it is supported 1000Mbps with Fiber media, so the result will show 1G/Full only.

Default: None, depends on the result of the negotiation.

Flow Control:

Show each port's flow control status. There are two types of flow control in Ethernet, Backpressure for half-duplex operation and Pause flow control (IEEE802.3x) for full-duplex operation. RC-2201/02 supports both of them. When duplex mode is half duplex, there is only one status "Backpressure" for flow control. When in full duplex, it may be one of it may be one of "Symmetric", "Asymmetric", or "Disabled".

Default: Symmetric flow control if in full-duplex mode. Backpressure if in half-duplex mode.

Media Type:

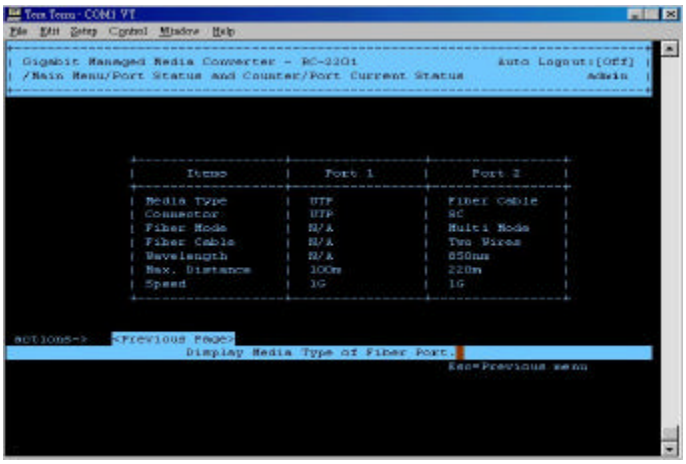


Fig. 4-5 Media Type

Parameter description:

Media Type:

For port 1, only “UTP” is in this model.

For port 2, only “Fiber Cable” is in this model.

Connector:

Display the connector type, for instance, UTP, SC, ST, LC and so on.

Fiber Mode:

Display the fiber mode, for instance, Multi-Mode, Single-Mode.

Fiber Cable:

Display the cable type, for instance, Two Wires, Single wire.

Wave Length:

Display the wavelength of the light transmitted in the fiber, for instance, 850nm, 1310nm.

Max. Distance:

Display the maximum distance the port supported, for instance, 100m, 10km, 20km and so on.

Speed:

Display the maximum speed of the port, for instance, “1G”, “100M”.

4-2-2. Port Counters

The function Port Counter collects any information and provides the counting about the traffic of the port, no matter the packet is good or bad. After selecting a port (See Fig. 4-6), you will see the figures displayed in the following two pages. (See Fig. 4-7~4-8)

Each data field has 12-digit long. If the counting is overflow, the counter will be reset and restart counting. The data is updated every time interval defined by the user. The valid range is 3 to 10 seconds. The Refresh Interval is used to set the update speed. Default update time is 5 seconds.

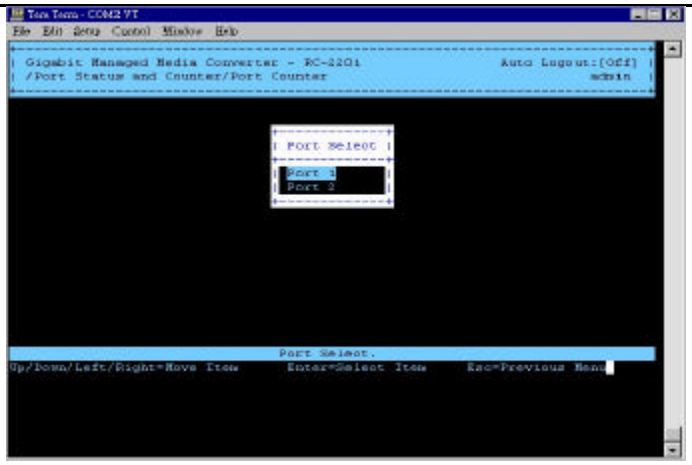


Fig. 4-6 Port Select

Fig. 4-7 Port Counter Port 1 (Page 1)

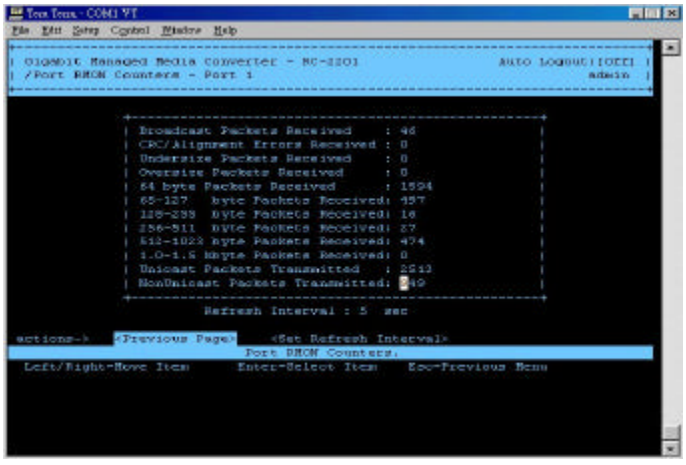

Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/Port RMON Counters - Port 1
admin
Broadcast Packets Received : 46
CRC/Alignment Errors Received : 0
Undersize Packets Received : 0
Oversize Packets Received : 0
64 byte Packets Received : 1594
65-127 byte Packets Received: 457
128-255 byte Packets Received: 16
256-511 byte Packets Received: 37
512-1023 byte Packets Received: 474
1.0-1.5 kbyte Packets Received: 0
Unicast Packets Transmitted : 2513
NonUnicast Packets Transmitted: 249
Refresh Interval : 5 sec
<Previous Page>
<Set Refresh Interval>
Port RMON Counters.
Left/Right=Move Item
Enter=Select Item
Esc=Previous Menu

Fig. 4-8 Port Counter Port 1 (Page 2)

Function name:

Port Counters

Function description:

Display the counting of each port's traffic, sorted according to the items described in the parameter description.

Parameter description:

Tx Good Packet:

The counting number of the packet transmitted successfully.

Rx Good Packet:

The counting number of the packet received which is treated as good.

Tx Byte:

Total transmitted bytes.

Rx Byte:

Total received bytes.

Tx Bad Packet:

The counting number of the packet transmitted abnormally.

Rx Bad packet:

The counting number of the packet received which is treated as bad.

Collision Counter:

Collision times.

Tx Abort Packet:

The counting number of the packet aborted during transmission.

Tx Speed (bps):

Show the average transmission rate in bit per second. The time interval is user-defined.

Rx Speed (bps):

Show the average received data rate in bit per second. The time interval is user-defined.

Broadcast Packets Received:

Show the counting number of the broadcast packet received.

CRC/Alignment Errors Received:

Show the counting number of the packet with CRC and Alignment error.

Undersize Packets Received:

Show the counting number of the packet with the length less than 64 bytes.

Oversize Packets Received:

Show the counting number of the packet with the length more than 1522/1536 bytes depend on maximum packet length setting.

64 byte Packets Received:

Show the counting number of the packet with exact 64 bytes length.

65-127 byte Packets Received:

Show the counting number of the packet with the length between 65 to 127 bytes.

128-255 byte Packets Received:

Show the counting number of the packet with the length between 128 to 255 bytes.

256-511 byte Packets Received:

Show the counting number of the packet with the length between 256 to 511 bytes.

512-1023 byte Packets Received:

Show the counting number of the packet with the length between 512 to 1023 bytes.

1.0-1.5k byte Packets Received:

Show the counting number of the packet with the length between 1024 to 1536 bytes.

Unicast Packets Transmitted:

Show the counting number of total unicast packets transmitted.

Nonunicast Packets Transmitted:

Show the counting number of both total multicast and broadcast packets transmitted.

4-2-3. Port Configuration

Port Configuration is applied to change the setting of each port. In this configuration function, you can set/reset the following functions, Port State, Auto negotiation, Speed/Duplex, and Flow Control. All of them are described in detail below.

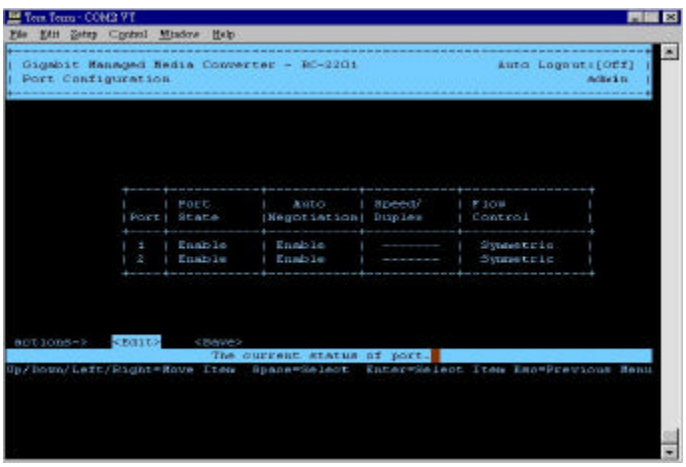


Fig. 4-9 Port Configuration

Function name:

Port Configuration

Function description:

It is used to set each port's operation mode. RC-2201/02 supports 4 parameters for each port. They are State, Auto Negotiation, Speed/Duplex, and Flow Control.

Parameter description:

State:

Show if the communication capability of the port is Enabled or Disabled. When enabled, traffic can be transmitted and received via this port. When disabled, the port is blocked and no traffic can be transferred through this port. Port State is configured by the user. There are only two states "Enable" and "Disable" able to be chosen. If you set a port's State "Disable", then that port is prohibited to pass any traffic, even it looks Link up. Default is Enable.

Auto Negotiation:

Only "Enable" and "Disable" two states can be chosen. "Enable" means the port adopted the auto-negotiation algorithm to exchange the capability with the linked partner. When enabled, the speed, duplex mode and flow control mode may change. "Disable" means the forced mode is adopted. When disabled, if you want to set up a connection successfully, you must have both port configuration of local port and linked partner be the same. If their configuration is different, the link will not be set up successfully. In RC-2201/02, the 100Mbps fiber module supports forced mode only; as to the 1Gbps fiber module, it supports auto and forced modes.

Speed / Duplex:

Set the mode of speed and duplex. In speed, 10/100/1000Mbps baud rate is available for port 1, Gigabit baud rate in port 2. If the media is 1Gbps fiber, it is always 1000Mbps and the duplex is full only. If the media is TP, the Speed/Duplex is comprised of the combination of speed mode, 10/100/1000Mbps, and duplex mode, full duplex and half duplex.

Flow Control:

There are three modes to choose in flow control, including Asymmetric, Symmetric and Disable. If Symmetric flow control is set, both parties can send PAUSE frame to the transmitting device(s) while the receiving port is too busy to handle. If Asymmetric flow control is set, this will let the receiving port not care the PAUSE frame from transmitting device(s). This is one-way flow control. When it is set Disable, there will be no flow control in the port. It drops the packet if too much to handle.

Default: Symmetric in full-duplex mode and Backpressure in half duplex.

4-3. Configuration

There are four major configuration function folders, including:

- **System Configuration**
  - Create Username / Password
  - Change Username / Password
  - IP Configuration
  - System Time Setting
  - Power Down Setting
- **Network Management**
  - SNMP Configuration
  - Packet Length
  - Broadcasting Suppression
  - **Spanning Tree Configuration**
  - Misc. Feature Configuration
  - **Filtering Configuration**
- **Trap/Alarm Configuration**
  - Trap Events Configuration
  - Alarm Configuration
- **Save Configuration**
  - Save As User Configuration
  - Restore Default Configuration
  - Restore User Configuration

4-3-1. System Configuration

There are five functions contained in the System Configuration function folder. They are 1) Create Username/Password, 2) Change Username/Password, 3) IP Configuration, 4) System Time Setting, and 5) Power Down Setting.

4-3-1-1. Create Username / Password

In this function, only administrator can create the new guest username and password. Only one administrator user and maximum four guest users are allowed to exist in the RC-2201/02. The default setting is as follows:

Username : admin
Password : admin

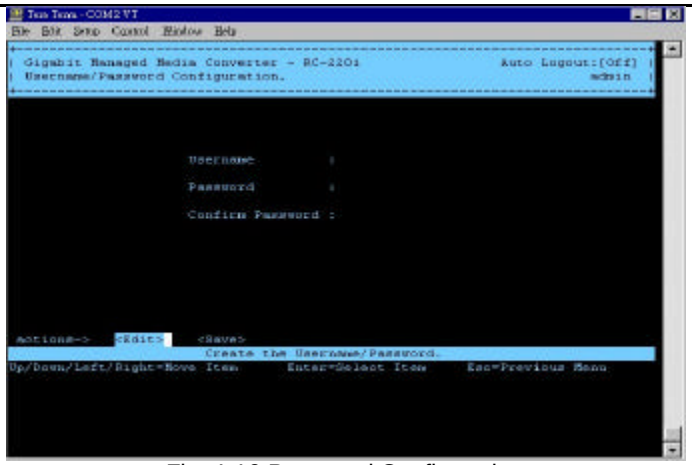


Fig. 4-10 Password Configuration

4-3-1-2. Change Username / Password

In this function, only administrator can modify or delete the username and password. Administrator can modify other guest identities' password without confirming the password but it is necessary to modify the administrator-equivalent identity. Guest-equivalent identity can modify his password only. Please note that you must confirm administrator/guest identity on the list of Username in advance before configuring the username and password.

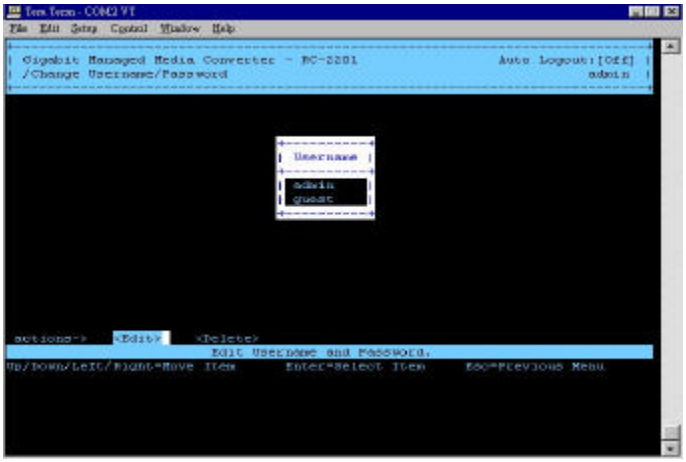


Fig. 4-11 Change Username/Password

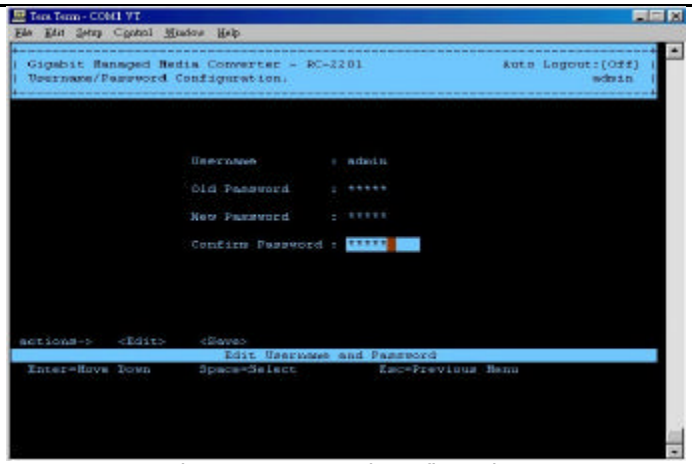


Fig. 4-12 Password Configuration

4-3-1-3. IP Configuration

IP configuration is one of the most important configurations in RC-2201/02. Without the proper setting, network manager will not be able to see the device. RC-2201/02 supports both manual IP address setting and automatic IP address setting via DHCP server. When IP address is changed, you must reboot the converter to have the setting taken effect and use the new IP to browse for web management.

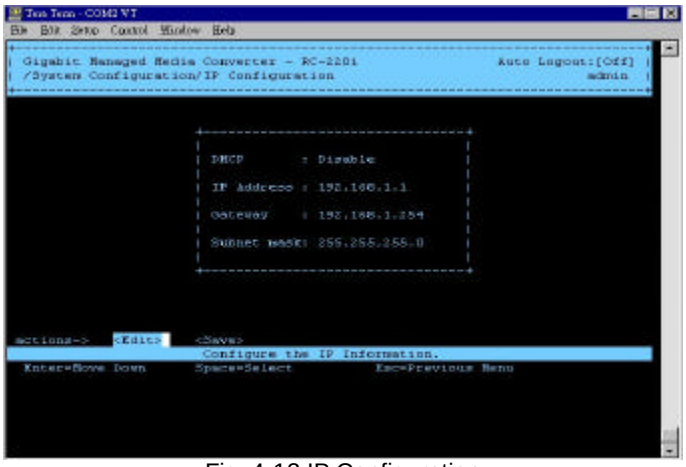


Fig. 4-13 IP Configuration

Function name:

IP Configuration

Function description:

Set IP address, subnet mask and default gateway for RC-2201/02.

Parameter description:

DHCP:

RC-2201/02 supports DHCP client used to get an IP address automatically if you set this function "Enable". RC-2201/02 will find the DHCP server existed in the network to get an IP address. If DHCP server

is down or does not exist and DHCP in RC-2201/02 is enabled, then RC-2201/02 will count down 60 seconds and use its fixed IP set last time. If set this function "Disable", you have to input IP address manually.

Default: Disable

IP address:

Users can configure the IP settings and fill in new values if users set the DHCP function "Disable". Then, move the cursor to **<Save>** and press **<Enter>** key to update.

Default: 192.168.1.1

Default gateway:

Set an IP address for a gateway to handle those packets that do not meet the rules predefined in a device. If a packet does not meet the criteria for other routers, then it must be sent to a default router. This means any packet with undefined TCP/IP information will be sent to this device unconditionally.

Default: 192.168.1.254

Subnet mask:

Set the subnet mask value which is the same as that of network it attaches. For more information, please also see the section "IP Address Assignment" in this manual.

Default: 255.255.255.0

4-3-1-4. System Time Setting

RC-2201/02 provides manual and automatic ways to set the system time via NTP. Manual setting is simple and you just input "Year", "Month", "Day", "Hour", "Minute" and "Second" within the valid value range indicated in each item. If you input an invalid value, for example, 61 in minute, the converter will clamp the figure to 59.

NTP is a well-known protocol used to synchronize the clock of the RC-2201/02 system time over a network. NTP, an internet draft standard formalized in RFC 1305, has been adopted on the system is version 3 protocol. RC-2201/02 provides four built-in real internet site NTP server IP addresses and a user-defined NTP server IP address. The time zone is Greenwich-centered which uses the expression form of GMT+/- xx hours.

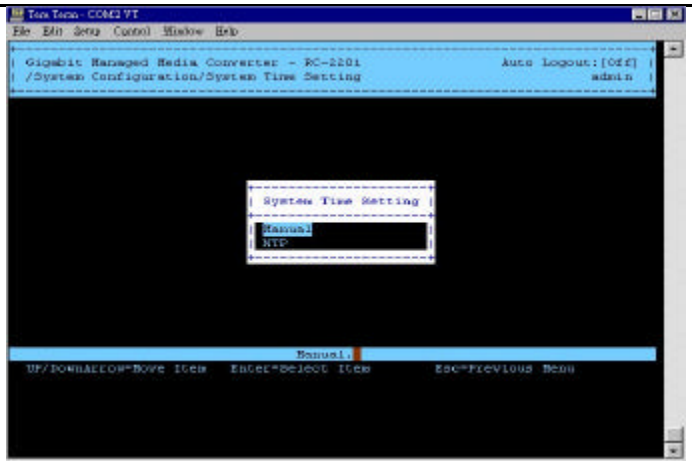


Fig. 4-14 System Time Setting

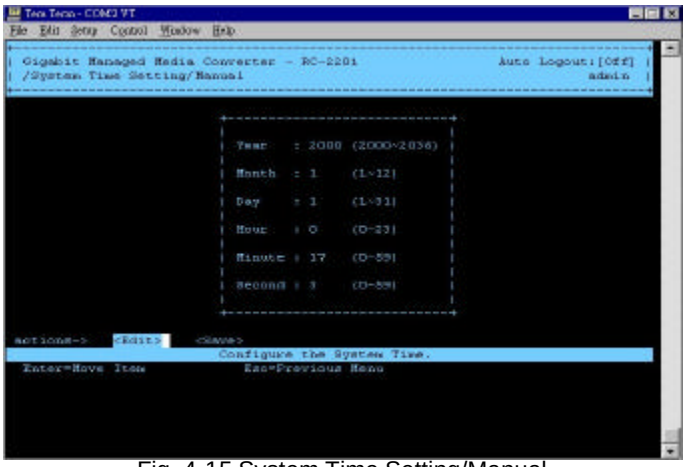


Fig. 4-15 System Time Setting/Manual

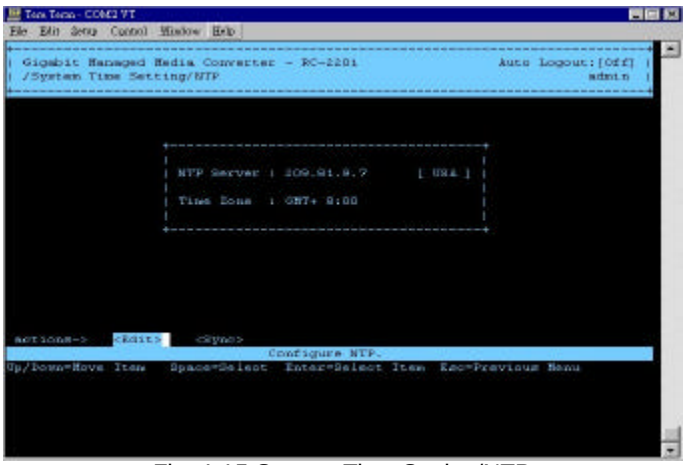


Fig. 4-15 System Time Setting/NTP

Function name:

System Time Setting

Function description:

Set the system time manually or get network time from NTP server for system time reference in RC-2201/02.

Parameter description:

Manual:

User can key in Year, Month, Day, Hour, Minute and Second directly to synchronize the system time with local time.

Default: Year = 2000, Month = 1, Day = 1

Hour = 0, Minute = 0, Second = 0

NTP:

Select NTP protocol to synchronize the system time, you only need to choose a NTP server and select a Time Zone. Then, move the cursor to **<Sync>** and press **<Enter>** key, the system will take effect immediately. This will not automatically update the system time periodically.

4-3-1-5. Power Down Setting

With this function, users can choose if users would like RC-2201/02 to power down automatically when the cooling fan stopped, and the temperature is over 60 degree.

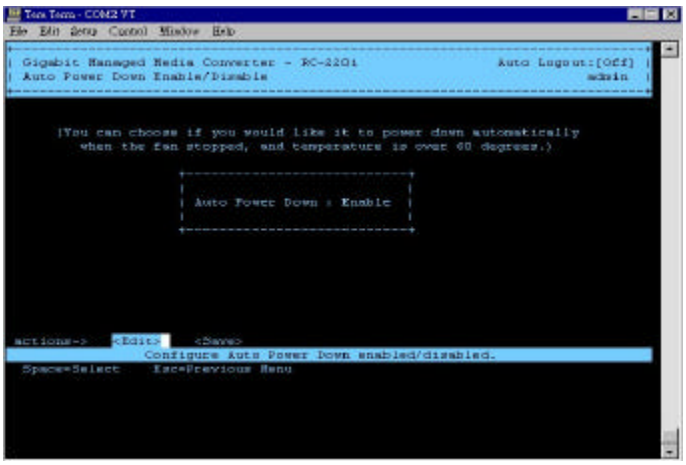

Tera Term - COM2 VT
File Edit Setup Control Window Help
Gigabit Managed Media Converter - RC-2201
Auto Power Down Enable/Disable
Auto Logout:[Off]
admin
(You can choose if you would like it to power down automatically
when the fan stopped, and temperature is over 60 degrees.)
Auto Power Down : Enable
actions-> <Edit> <Save>
Configure Auto Power Down enabled/disabled.
Space=Select Esc=Previous Menu

Fig. 4-16 Power Down Setting

Function name:

Power Down Setting

Function description:

RC-2201/02 supports Power Down Setting, and you can enable or disable this function on the web page.

Parameter description:

Enable:

User can enable Power Down Setting, and RC-2201/02 will be shut down automatically when the cooling fan stopped and the temperature is

over 60 degree.

Default : Enable

Disable:

RC-2201/02 will not be shut down even when the system temperature is over 60 degree.

4-3-2. Network Management

There are six functions contained in the System Configuration function folder. They are 1) SNMP Configuration, 2) Packet Length, 3) Broadcasting Suppression, 4) Spanning Tree Configuration, 5) Misc. Feature Configuration, and 6) Filtering Configuration.

4-3-2-1. SNMP Configuration

Any Network Management running the Simple Network Management Protocol (SNMP) can manage the Managed Media Converter equipped with SNMP agent, provided that the Management Information Base (MIB) is installed correctly on the management station. The SNMP is a protocol that is used to govern the transfer of information between SNMP manager and agent. The SNMP agent is running on the converter if you set the SNMP "Enable". If the SNMP is set "Disable", the related Community Name, Trap Host IP Address, Trap and RMON counters will be ignored. In the SNMP Configuration function, RC-2201/02 provides:

1) SNMP enable/disable selection. Default is "Enable".

2) User-definable community name for the authentication of GET, SET and TRAP. Community string is used as a password to authenticate the request. If both have the same community name, they can talk each other; otherwise, network management unit cannot access the Managed Media Converter via SNMP protocol. Default community name for SET is "private", and for both GET and TRAP, the default community is "public".

3) 4 trap hosts each with user-definable community name. To set up a trap host means to create a trap manager by assigning an IP address to host the trap message. In other words, the trap host is a network management unit with SNMP manager receiving the trap message from the Managed Media Converter with SNMP agent issuing the trap message. 4 trap hosts can prevent the important trap message from losing.

4) Enable/Disable to issue public trap events. They are cold start trap, warm start trap, link down trap, link up trap and authentication failure trap. As to the enterprise (no.6) trap, which is private trap, is listed in RC-2201/02 MIB file. If all public traps are disabled, no public trap message will be sent. If the trap is enabled, the trap will send to the trap host when a trap happens.

A SNMP manager must pass the authentication, then it can access the agent. So, both parties must have the same community name. You can also define the system name, system location and contact person for easy management via SNMP manager.

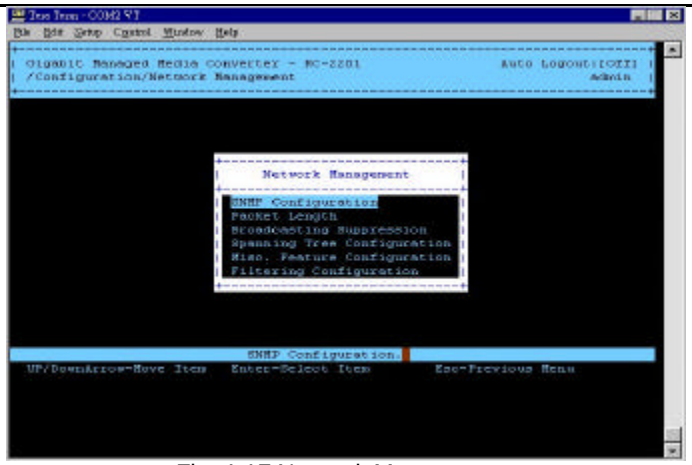


Fig. 4-17 Network Management

Three functions are offered in the SNMP configuration, including SNMP Status, Community Strings and Trap Configuration. The explanations of these functions are as below in order.

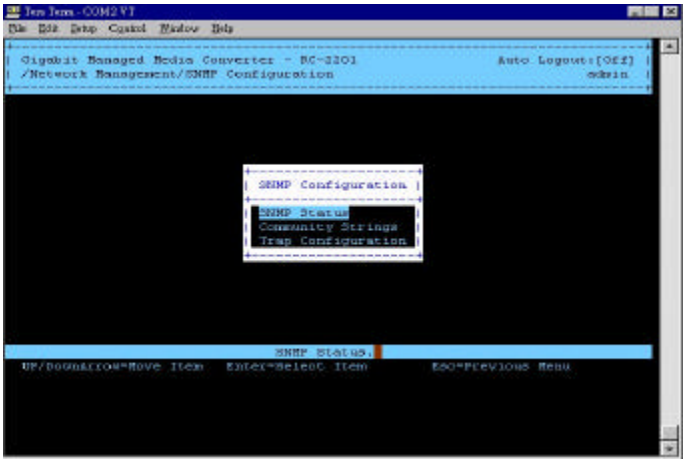


Fig. 4-18 SNMP Configuration

Function name:

SNMP Status

Parameter description:

SNMP Status:

Only “Enable” and “Disable” two kinds of status are supported. User can use the **<space>** bar to toggle the status of this function

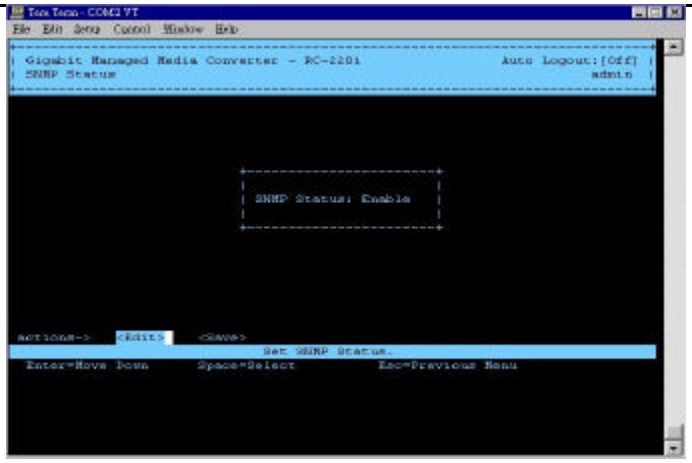


Fig. 4-19 SNMP Status

Function name:

Community Strings

Parameter description:

Get Community Name:

Users can fill in specified SNMP Get community name.

Set Community Name:

Users can fill in specified SNMP Set community name.

Trap Host 1-4 IP Address / Community Name:

Users can fill in specified trap host 1-4 IP addresses with SNMP community name.

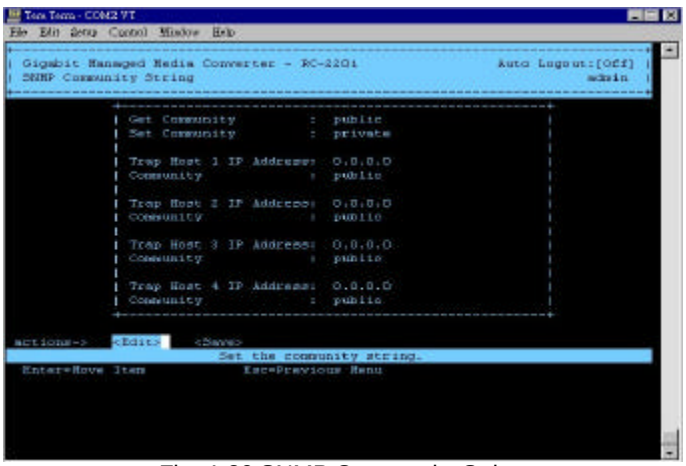


Fig. 4-20 SNMP Community String

Function name:

Trap Configuration

Function description:

Trap is a PDU packet sent by SNMP agent in the Managed Media Converter.

The Managed Media Converter will send the trap packet containing the useful information about an unusual event to the SNMP manager. The information includes cold start trap, warm start trap, link down trap, link up trap and authentication failure trap. In RC-2201/02 Converter, SNMP agent will automatically send cold start trap and warm start trap to SNMP manager after booting successfully.

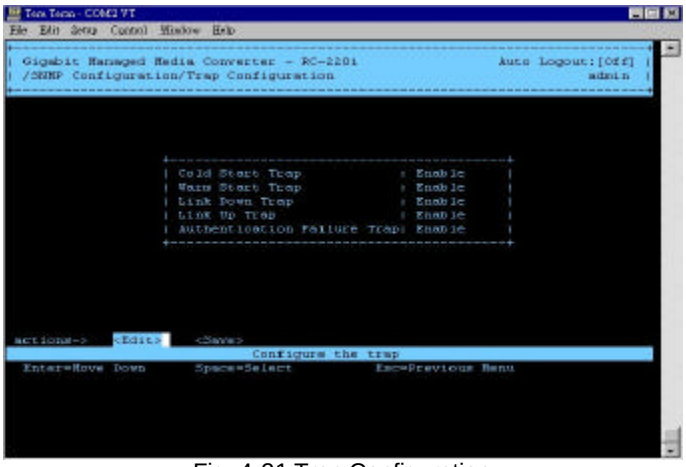


Fig. 4-21 Trap Configuration

Parameter description:

Cold Start Trap:

This trap packet will be sent while RC-2201/02 Converter's power is cycling.

Warm Start Trap:

This trap packet will be sent while rebooting RC-2201/02 Converter by means of pressing the RC-2201/02's RESET button or running Reboot function of software.

Link Down Trap:

This trap packet will be sent while the RC-2201/02 Converter's UTP link status is changed from up to down. The Link Down Trap Packet will not be sent while RC-2201/02 Converter's fiber port link status is changed from up to down. The fiber port Link Down Event will be stored in Log Data.

Link Up Trap:

This trap packet will be sent while the RC-2201/02 Converter's UTP or Fiber port link status is changed from down to up.

Authentication Failure Trap:

This trap packet will be sent while the RC-2201/02 SNMP agent authentication failure occurs. Authentication failure means that SNMP agent receives a SNMP request with error community name.

4-3-2-2. Packet Length

RC-2201/02 provides two levels of Ethernet frame size for the user to set up. One is 1536 bytes and the other is 1522 bytes. After selecting one of these two

options, then move the cursor to **<Save>** and press **<Enter>** key, the setting will take effect immediately. Default setting is 1522 bytes long which can afford accommodating the size of the tagged VLAN frame.

Default: 1522 bytes

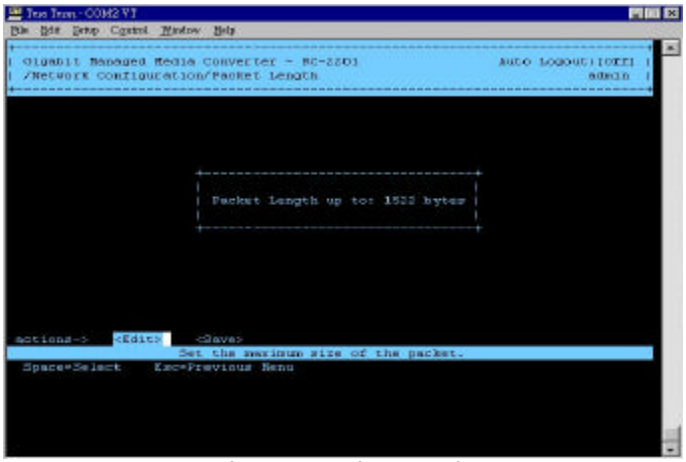


Fig. 4-22 Packet Length

4-3-2-3. Broadcasting Suppression

The Broadcasting Suppression function is used to spread the request broadcast packet into a bigger time frame to prevent the traffic congestion due to broadcast packets from many network devices which may seek its NMS, boot server, DHCP server and many connections predefined when the whole building or block lose the power and then reboot and recover. At this moment, a bunch of converter or other network device on the LAN will try its best to find the server to get the services or try to set up the predefined links, they will issue many broadcast packets in the network.

RC-2201/02 supports a random delay time for DHCP and boot delay for each device. This suppresses the broadcast storm while all devices are at booting stage in the same time. The maximum user-defined delay time is 30 sec. If Broadcasting Suppression function is enabled, the delay time is set randomly, ranging from 0 to 30 seconds, because the exactly delay time is computed by the converter itself. The default is “Disable”.

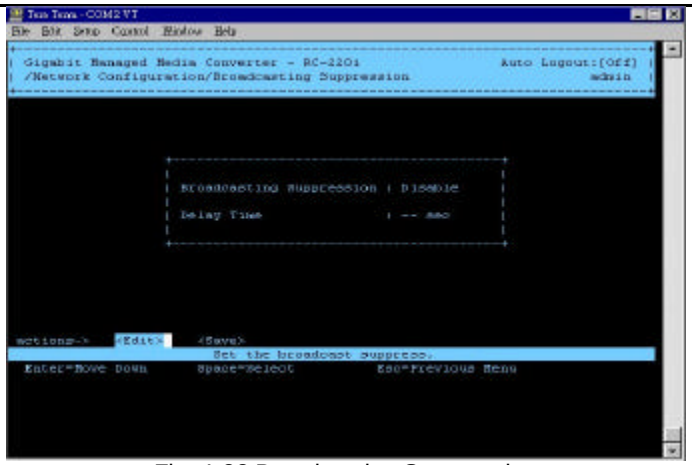


Fig. 4-23 Broadcasting Suppression

4-3-2-4. Spanning Tree Configuration

The Spanning Tree Protocol (STP) is a standardized method (IEEE 802.1D) for avoiding loops in switched networks. When STP is enabled, ensure that only one path is active between any two nodes on the network at a time. User can enable Spanning Tree Protocol on converter' s web management and then set up other advanced items. We recommend that you enable STP on all switches and converters to ensure a single active path on the network.

4-3-2-4-1. STP Enable/Disable

Function name:

STP State Setting

Function description:

Spanning Tree Protocol: User can use the **<Space>** key to toggle the status of this function.

Parameter description:

Spanning Tree Protocol:

Set 802.1W Rapid STP function Enable / Disable.

Default is “Disable”

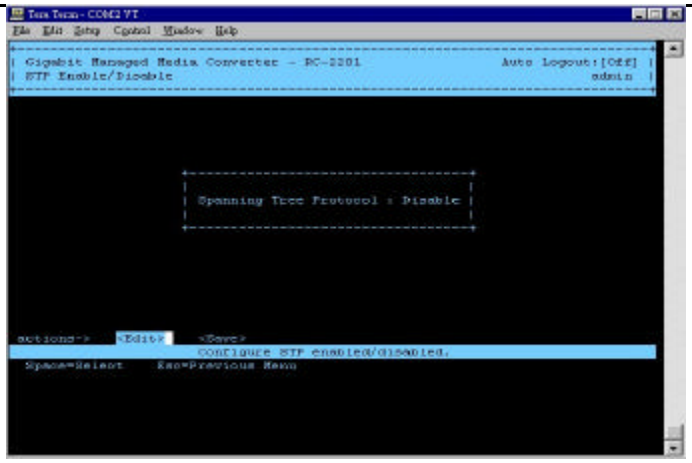


Fig. 4-24 STP Enable/Disable

4-3-2-4-2. STP Status

Function name:

STP Status

Function description:

In the Spanning Tree Status, user can read 11 parameters to know STP current status. The 11 parameters' description is listed in the following table.

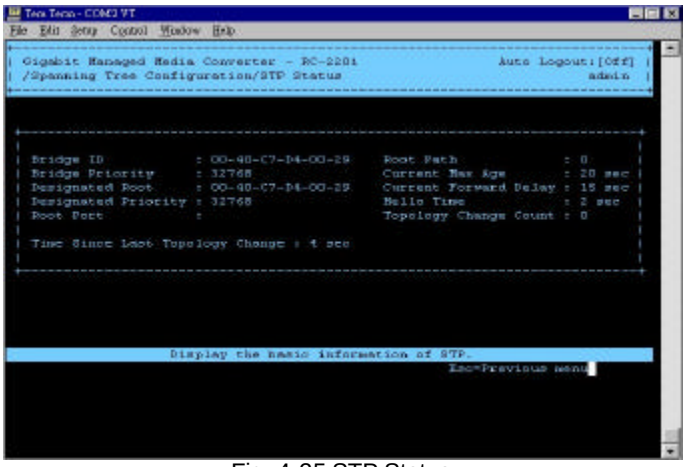

Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/Spanning Tree Configuration/STP Status
admin
Bridge ID : 00-40-C7-D4-00-29
Bridge Priority : 32768
Designated Root : 00-40-C7-D4-00-29
Designated Priority : 32768
Root Port :
Root Path : 0
Current Max Age : 20 sec
Current Forward Delay : 15 sec
Hello Time : 2 sec
Topology Change Count : 0
Time Since Last Topology Change : 4 sec
Display the basic information of STP.
Esc=Previous menu

Fig. 4-25 STP Status

Parameter description:

STP Status:

Show the current STP Enabled / Disabled status. Default is "Disabled".

Bridge ID:

Show converter's bridge ID which stands for the MAC address of this converter.

Bridge Priority:

Show this converter's current bridge priority setting. Default is 32768.

Designated Root:

Show root bridge ID of this network segment. If this converter is a root bridge, the "Designated Root" will show this converter's bridge ID.

Designated Priority:

Show the current root bridge priority.

Root Port:

Show port number connected to the root bridge with the lowest path cost.

Root Path Cost:

Show the path cost between the root port and the designated port of the root bridge.

Current Max. Age (sec):

Show the current root bridge maximum age time. Maximum age time is used to monitor if STP topology needs to change. When a bridge does not receive a hello message from root bridge until the maximum age time is counted down to 0, the bridge will treat the root bridge malfunctioned and issue a Topology Change Notification (TCN) BPDU to all other bridges. All bridges in the LAN will re-learn and determine which the root bridge is. Maximum Age time is assigned by root bridge in unit of seconds. Default is 20 seconds.

Current Forward Delay (sec):

Show the current root bridge forward delay time. The value of Forward Delay time is set by root. The Forward Delay time is defined as the time spent from Listening state moved to Learning state or from Learning state moved to Forwarding state of a port in bridge.

Hello Time (sec):

Show the current hello time of the root bridge. Hello time is a time interval specified by root bridge, used to request all other bridges periodically sending hello message every "hello time" seconds to the bridge attached to its designated port.

STP Topology Change Count:

STP Topology Change Count expresses the time spent in unit of seconds since the beginning of the Spanning Tree Topology Change to the end of the STP convergence. Once the STP change is converged, the Topology Change count will be reset to 0. The figures showing in the screen may not be the exact time it spent but very close to, because the time is eclipsing.

Time Since Last Topology Change (sec):

Time Since Last Topology Change is the accumulated time in unit of seconds the STP has been since the last STP Topology Change was made. When Topology Change is initiated again, this counter will be reset to 0. And it will also count again once STP topology Change is completed.

4-3-2-4-3. STP Configuration

The STP, Spanning Tree Protocol, actually includes RSTP. In the Spanning Tree Configuration, there are five parameters open for the user to configure as user's idea. Each parameter description is listed below.

Function name:

STP State Setting

Function description:

User can set the following Spanning Tree parameters to control STP function enable/disable, select mode RSTP/STP and affect STP state machine behavior to send BPDU in this converter. The default setting of Spanning Tree Protocol is "Disable".

Parameter description:

Bridge Priority:

The lower the bridge priority value is, the higher priority it has. Usually, the bridge with the highest bridge priority is the root. If you want to have RC-2201/02 as root bridge, you can set this value lower than that of bridge in the LAN. The valid value is 0 ~ 61440.

Default : 32768.

Hello Time:

Hello Time is used to determine the periodic time to send normal BPDU from designated ports among bridges. It decides how long a bridge should send this message to other bridge to tell I am alive. When RC-2201/02 is the root bridge of the LAN, for example, all other bridges will use the hello time assigned by RC-2201/02 to communicate with each other. The valid value is 1 ~ 10 in unit of second.

Default : 2 seconds.

Max. Age:

When RC-2201/02 is the root bridge, the whole LAN will apply this figure set by RC-2201/02 as their maximum age time. When a bridge received a BPDU originated from the root bridge and if the message age conveyed in the BPDU exceeds the Max. Age of the root bridge, the bridge will treat the root bridge malfunctioned and issue a Topology Change Notification (TCN) BPDU to all other bridges. All bridges in the LAN will re-calculate and determine who the root bridge is. The valid value of Max. Age is 6 ~ 40 seconds.

Default : 20 seconds.

Forward Delay:

You can set the root bridge forward delay time. This figure is set by root bridge only. The forward delay time is defined as the time spent from Listening state moved to Learning state and also from Learning state moved to Forwarding state of a port in bridge. The forward delay time contains two states, Listening state to Learning state and Learning state to Forwarding state. It assumes that forward delay time is 15 seconds, then total forward delay time will be 30 seconds. This has much to do with the STP convergent time which will be more than 30 seconds

because some other factors. The valid value is 4 ~ 30 seconds.

Default : 15 seconds.

Force Version:

Two options are offered for the user's choosing STP algorithm. One is RSTP and the other is STP. If STP is chosen, RSTP will run as a legacy STP. RC-2201/02 supports RSTP (802.1w) which is backward compatible with STP (802.1d).

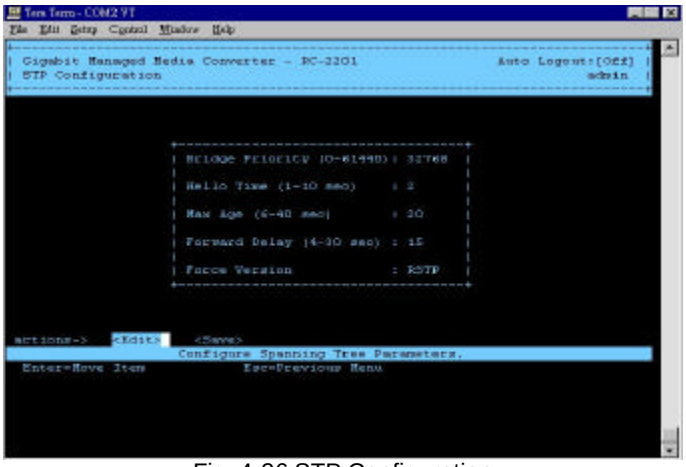


Fig. 4-26 STP Configuration

Function name:

Port Setting

Function description:

In the STP Port Setting, one item selection and four parameters settings are offered for user's setup. User can disable and enable each port by selecting each Port State item. User also can set "Priority" and "Path Cost" of each port by filling in the desired value and set "Admin Edge Port" and "Admin Point To Point" by selecting the desired item.

Parameter description:

Port State:

It displays the current state of a port. We cannot manually set it because it displays the status only. There are three possible states. (according to 802.1w specification)

DISCARDING state indicates that this port can neither forward packets nor contribute learning knowledge.

Notice: Three other states (Disable state, BLOCKING state and LISTENING state) defined in the 802.1d specification are now all represented as DISCARDING state.

LEARNING state indicates this port can now contribute its learning knowledge but cannot forward packets still.

FORWARDING state indicates this port can both contribute its learning knowledge and forward packets normally.

Priority:

Priority here means Port Priority. Port Priority and Port Number are mixed to form the Port ID. Port IDs are often compared in order to determine which port of a bridge would become the Root Port. The range is 0 – 240.

Default is 128.

Path Cost:

The contribution value of the path through this port to Root Bridge. STP algorithm determines a best path to Root Bridge by calculating the sum of path cost contributed by all ports on this path. A port with a smaller path cost value would become the Root Port more possibly. The range is 0 – 200,000,000. In RC-2201/02, path cost with 0 value means automatic which will automatically assign the path cost value defined by IEEE 802.1w.

Default: 128

802.1w RSTP recommended value: (Valid range: 1 – 200,000,000)

10 Mbps : 2,000,000

100 Mbps : 200,000

1 Gbps : 20,000

Admin Edge Port:

If user selects "Yes", this port will be an edge port. An Edge Port is a port connected to a device that knows nothing about STP or RSTP. Usually, the connected device is an end station. Edge Ports will immediately transit to forwarding state. User can select "Yes" or "No".

Default: No

Admin Point To Point:

We say a port is on a point-to-point link if the port is in full-duplex mode. RSTP fast convergence can only happen on a point-to-point link. To determine if this port is on a point-to-point link is by auto-detecting the port's duplex mode if the parameter is set to "Auto". If the parameter is set "True", the port is unconditionally considered to be on a point-to-point link. If the parameter is set to "False", fast transition to Forwarding state will not happen on this port. User can select "Auto", "True" or "False".

Default : Auto

M Check:

Migration Check. It forces the port sending out an RSTP BPDU instead of a legacy STP BPDU at the next transmission. The only benefit of this operation is to make the port quickly get back to act as an RSTP port. Move the cursor to **<M Check>** and press **<Enter>** key to send a RSTP BPDU from the port you specified.

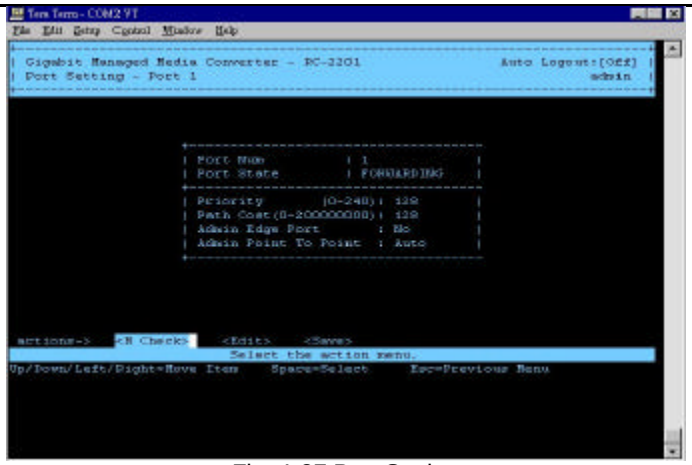

Tera Term - COM2 VT
File Edit Setup Control Window Help
Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
Port Setting - Port 1
admin
Port Num : 1
Port State : FORWARDING
Priority (0-240) : 128
Path Cost(0-200000000) : 128
Admin Edge Port : No
Admin Point To Point : Auto
action-> <N Check> <Edit> <Save>
Select the action menu.
Up/Down/Left/Right=Move Item Space=Select Esc=Previous Menu

Fig. 4-27 Port Setting

4-3-2-5. Misc. Feature Configuration

Miscellaneous Feature Configuration gathers many functions, including MAC Table Maintenance, Broadcast Storm Filtering, Priority Queue Service and Qos Policy, which cannot be categorized to some function type. They are described below.

Function Name:

MAC Table Maintenance

Function Description:

This function is used to set the MAC Address Age-out Time applied to the whole MAC address table except some static MAC address. The range of MAC table entry age-out time is from 30,33,36…765 seconds.

If a source node has not visited the converter for a time longer than the Age-out Time, its responded MAC address information in the converter' s MAC table will be marked invalid by the converter' s aging function. This age-out rule will not be applied to the static MAC addresses.

The default age-out time is 300 seconds.

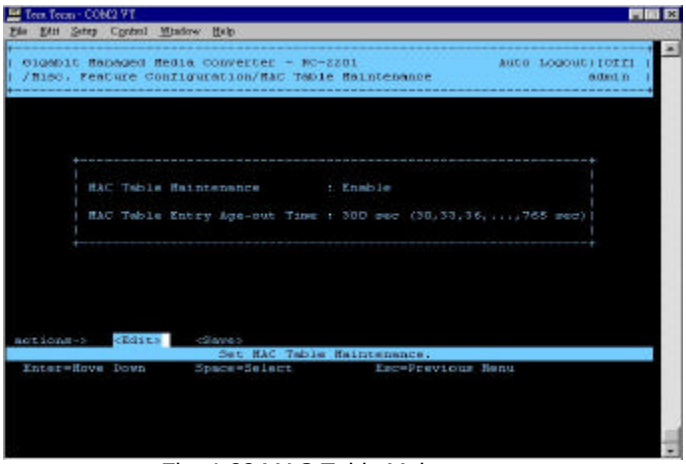

Tera Term - COM2 VT
File Edit Setup Control Window Help
Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/Misc. Feature Configuration/MAC Table Maintenance
admin
MAC Table Maintenance : Enable
MAC Table Entry Age-out Time : 300 sec (30,33,36,...,765 sec)
action-> <Edit> <Save>
Set MAC Table Maintenance.
Enter=Move Down Space=Select Esc=Previous Menu

Fig. 4-28 MAC Table Maintenance

Function Name:

Broadcast Storm Filtering

Function Description:

Broadcast Storm Filtering is applied to filter the converter's broadcast traffic. If you choose an upper threshold, it is enabled. It is a global function. The setting will be applied to all ports of the converter.

The threshold is the percentage of the port's total bandwidth used by broadcast traffic. When broadcast traffic for a port rises above the threshold you set, broadcast storm filter discards the extra broadcast traffic. This keeps the total broadcast traffic less than the threshold able to be forwarded and limits too many broadcast packet running over the network. RC-2201/02 supports five threshold values, which are 5%, 10%, 15%, 20%, and 25%.

Default is OFF.

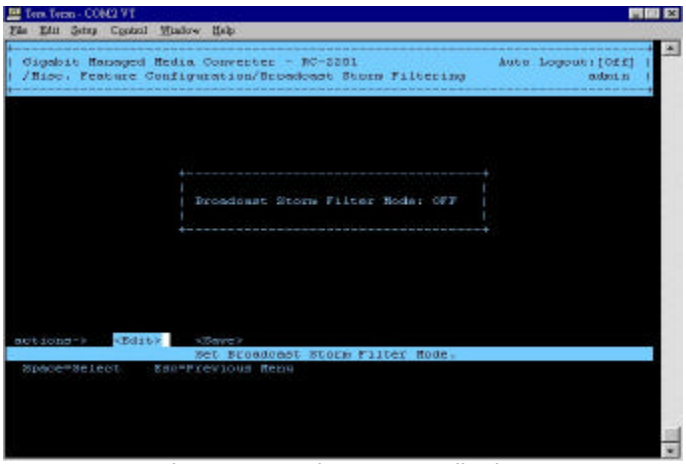


Fig. 4-29 Broadcast storm Filtering

Function name:

Priority Queue Service

Function Description:

RC-2201/02 provides three priority queue services for transmission scheduling, including FCFS, strict priority and WRR. It is a global function.

First Come First Service (FCFS): All incoming packets will be sent out upon the sequence of packet' s arrival order.

All High before Low: After all high priority packets are sent out, then low ones are sent in turn.

Weighted Round Robin (WRR): This is actually a transmission ratio of high priority packet and low priority packet. If you would like to repeatedly send 5 high priority packets first and then 2 low priority packets. You can set a 5 to high weight field and a 2 to low weight field in WRR function row. The WRR Default Setting High = 2, Low = 1

Parameter description:

Max. bridge transmit delay bound:

To set the time that the packets can reside in the queue of the converter.

The function "Maximum bridge transmit delay bound" is applied to limit the maximum queuing time of the packets in the converter. If enabled, the packets queued over the time set will be dropped. Valid values are 1 sec., 2 sec., 4 sec. and OFF.

Default value is OFF.

Delay Bound:

Limit the resided time of the low priority packets in the converter. If the low priority packet is not transmitted out and time set by "Delay bound" is enabled, the packet will be dropped. The valid delay time is 1 – 255 ms and OFF.

Default Max. Delay Time is 1ms.

NOTE: Make sure that "Max. bridge transmit delay bound" is enabled before enabling Delay Bound, because Delay Bound must work under "Max. bridge transmit delay bound is enabled".

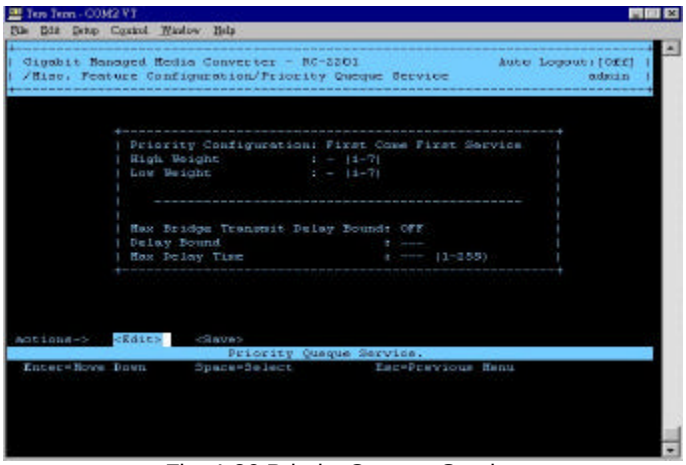

Tera Term - COM2 VT
File Edit Setup Control Window Help
Gigabit Managed Media Converter - RC-2201
Auto Logout:[OFF]
/Misc. Feature Configuration/Priority Queque Service
admin
Priority Configuration: First Come First Service
High Weight : - [1-7]
Low Weight : - [1-7]
Max Bridge Transmit Delay Bound: OFF
Delay Bound :
Max Delay Time : --- [1-255]
Actions-> <Edit> <Save>
Priority Queque Service.
Enter=Move Down Space=Select Esc=Previous Menu

Fig. 4-30 Priority Queque Service

Function name:

QoS Policy

Function Description:

It is used to assign which priority level is high or low. Normally, we map the priority levels 7 – 4 to be high priority and the priority levels 3 – 0 to be low priority. The mapped priority will be applied to the forwarding scheduler. In RC-2201/02, it is FCFS, Strict and WRR. The QoS policy is global.

Default: If enabled, priority levels 7 – 4 are assigned to be high priority, and priority levels 3 – 0 are assigned to be low priority.

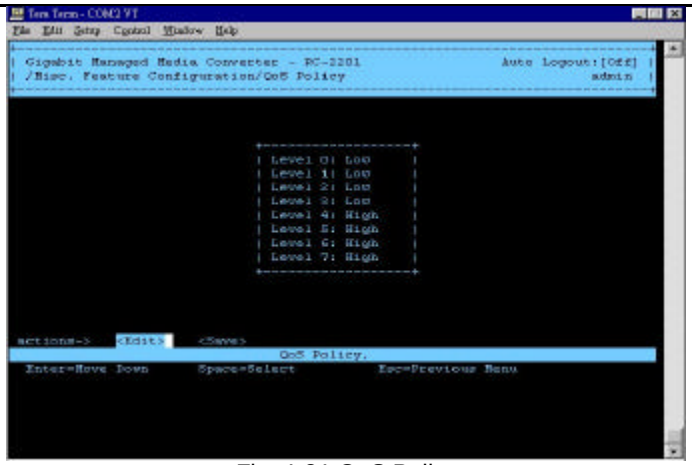


Fig. 4-31 QoS Policy

4-3-2-6. Filtering Configuration

The filtering function in RC-2201/02 is used to filter unwanted MAC address from accessing the converter based on some simple rules. RC-2201/02 provides three types of filtering function for security configuration. They are Allowed Forwarding MAC Address, Port Security Setting and Denied Forwarding MAC Address. You can configure it for different purposes of application. Here we list two examples for your reference.

Example 1:

Assumes administrator wishes a specified station can only access the converter from a specified port and the traffic from all other stations is rejected by that specified port. How should we configure RC-2201/02 for the case?

Solution:

First, enter the function "Allowed Forwarding MAC Address" to add an entry with the MAC address of the specified station on the Allowed Forwarding table of the specified port. The Security Port of the specified port should be then enabled in the "Port Security Setting" function. Finishing these processes, the specified port will not allow any other station to access the converter except the specified station. And if this specified station is moved to other port, it cannot access the converter, either.

Example 2:

Assumes an administrator wishes to deny a specified station from accessing the converter, which is to isolate the specified station from the converter. How should we configure RC-2201/02 for the case?

Solution:

For denying a specified station, it is easy. You just have to use the function "Denied Forwarding MAC Address" to configure it. Enter this function and select the **<Create New Entry>** function to add the MAC address of the specified station, which is rejected to access the converter. The Deny Forwarding function is global. It is applied to the whole converter.

Function name:

Allowed Forwarding MAC Address

Function description:

Allowed Forwarding MAC Address is a function to allow the user in the Allowed Forwarding table to access a specified port of the converter. Allowed Forwarding table associated with a specified port of a converter is setup by manually inputting MAC address and its alias name. The data in the table is kept until RC-2201/02 is powered off. The traffic with the source MAC address listed in the Allowed Forwarding Table can only access the converter from the port associated. The MAC address associated with the specified port cannot access any other port of the converter. All of the above settings will take effect only when "Port Security Setting" function of the associated port is enabled.

For adding a MAC address entry in the allowed table, you just need to fill in four parameters: MAC address, associated port, and priority. Just enter its **<Delete Entry>** function, you also can remove the MAC address entry you want.

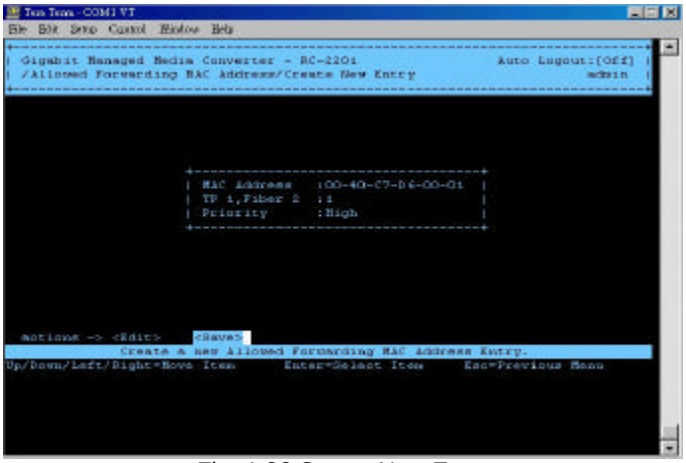


Fig. 4-32 Create New Entry

Parameter description:

Add New Entry:

Add an allowed forwarding MAC address entry. It is a six-byte long Ethernet hardware address and usually expressed by hex and separated by hyphens. For example,

00 – 40 - C7 - D6 – 00 – 01

Port:

Port number of RC-2201/02. It is 1 and 2.

Priority:

This is for traffic priority. User can configure a MAC address high priority or low priority. If MAC address is configured high priority, the packet with that DA or SA will be put into the high priority queue and be transmitted with high priority. If MAC address is configured low priority, the packet with that MAC address will be transmitted with low priority.

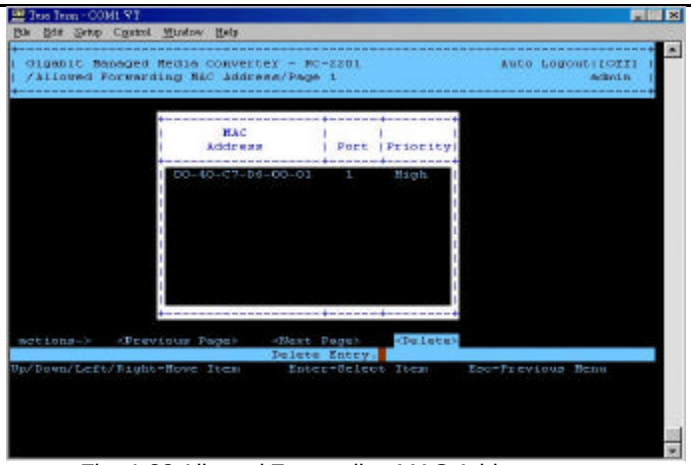


Fig. 4-33 Allowed Forwarding MAC Address

Delete Entry:

Delete an entry from the allowed forwarding MAC address table.

Function name:

Port Security Setting

Function description:

The usage of Port Security has to combine with Allowed Forwarding MAC Address function as mentioned above. In this function, you can enable it by pressing **<Space>** key in the port. If the user enables each port, then, the enabled port will stop learning MAC Address and block any incoming packet except that the packet with the MAC Address is listed in the Forwarding MAC Address table associated with that port. Move the cursor to **<Save>** and press **<Enter>** key, then the system will take effect immediately.

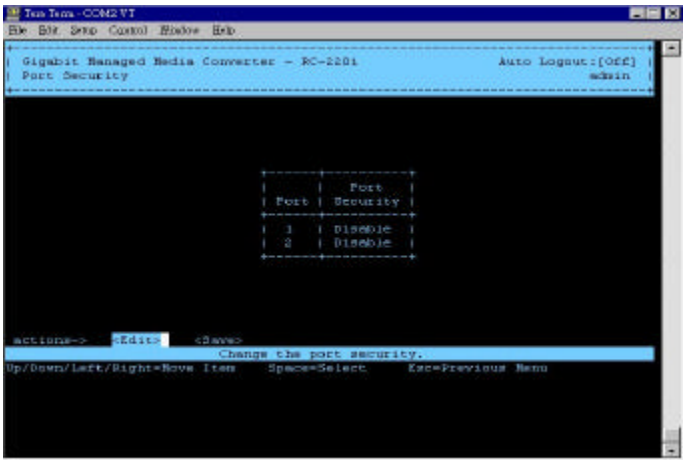


Fig. 4-34 Port Security

Function name:

Denied Forwarding MAC Address

Function description:

Denied Forwarding MAC Address is a function that denies the packet forwarding if the packet' s MAC Address is listed in the filtering MAC Address table. User can very easily maintain the table by filling in MAC Address and VLAN ID field individually. User also can insert or delete each entry by entering its **<Create New Entry>** or **<Delete Entry>** function.

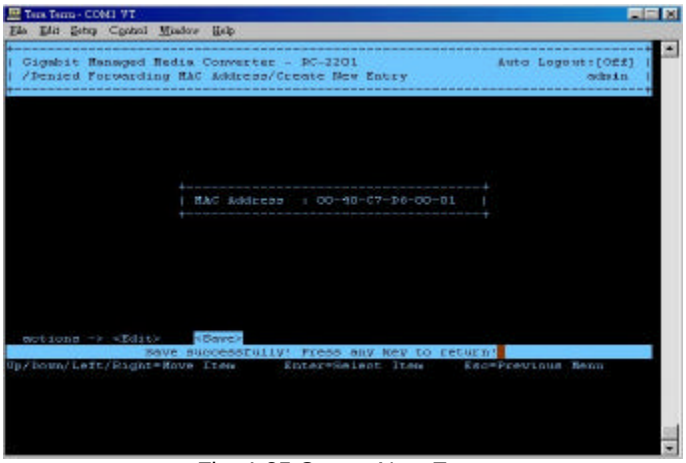


Fig. 4-35 Create New Entry

Parameter description:

Create New Entry:

Add a denied forwarding MAC address entry.

MAC Address:

It is a six-byte long Ethernet hardware address and usually expressed by hex and separated by hyphens. For example,

00 – 40 - C7 - D6 – 00 - 01

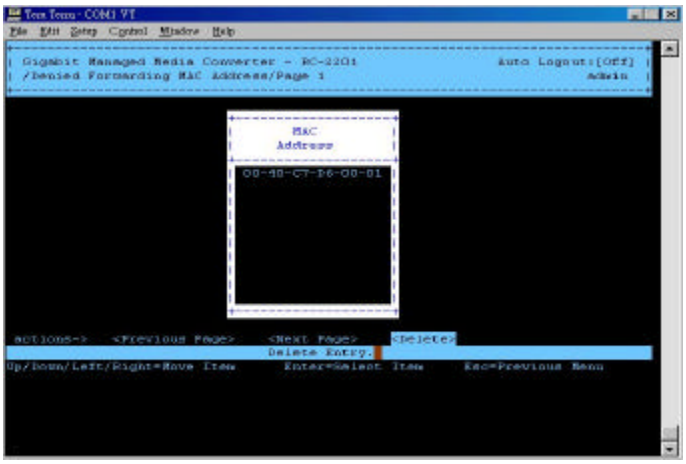


Fig. 4-36 Denied Forwarding MAC Address

Delete Entry:

Delete an entry from the allowed forwarding MAC address table.

4-3-3. Trap/Alarm Configuration

Function name:

Trap Events Configuration

Function description:

The Trap Events Configuration function is used to enable the Managed Media Converter to send out the trap information while pre-defined trap events occurred.

RC-2201/02 offers 16 different trap events to users for management. The trap information can be sent out in three ways, including e-mail, mobile phone SMS (short message system) and Trap. Move the cursor to **<Edit>** and press **<Enter>** key, then the message will be sent while users tick (☑) the trap event individually by pressing **<Space>** key on the console management shown as below.

Parameter description:

The traps RC-2201/02 supports are listed below.

STP: STP Topology Change, STP Disabled, STP Enabled

Temperature: Temperature Over/Under, Temperature Normal

Case: Case Opened, Case Closed

Flash: Flash Write Fail

FAN: FAN Down, FAN Working, Fan/Temperature Fail

Start: Cold Start, Warm Start

Link: Link Down, Link Up

Authentication Failure

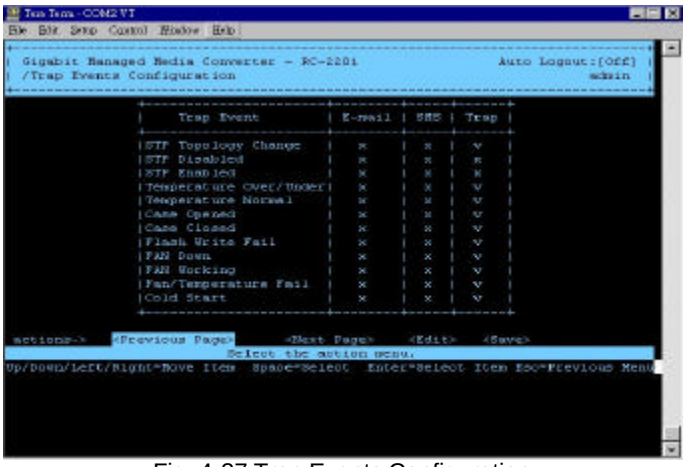


Fig. 4-37 Trap Events Configuration

Function name:

Alarm Configuration

Function description:

Alarm configuration is used to configure the persons who should receive the

alarm message via either email or SMS, or both. It depends on your settings. An email address or a mobile phone number has to be set in the web page of alarm configuration. Then, user can read the trap information from the email or the mobile phone. This function provides 6 email addresses and 6 mobile phone numbers at most. The 16 different trap events will be sent out to SNMP Manager when trap event occurs. After ticking trap events, you can fill in your desired email addresses and mobile phone numbers. Then, move cursor to **<Save>** and press **<Enter>** key to complete the alarm configuration. It will take effect in a few seconds.

Note: SMS may not work in your mobile phone system. It is customized for different systems.

Parameter description:

Email:

Mail Server: the IP address of the server transferring your email.

Username: your username on the mail server.

Password: your password on the mail server.

Email Address 1 – 6: email address that would like to receive the alarm message.

SMS:

Username: your username in ISP.

Password: your username in ISP.

Mobile Phone 1-6: the mobile phone number that would like to receive the alarm message.

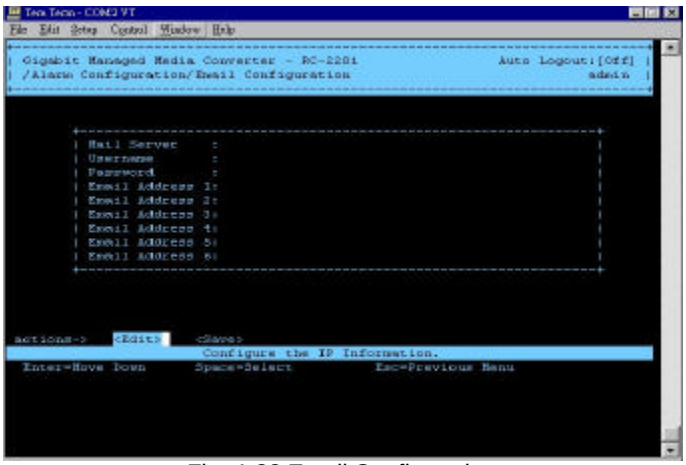


Fig. 4-38 Email Configuration

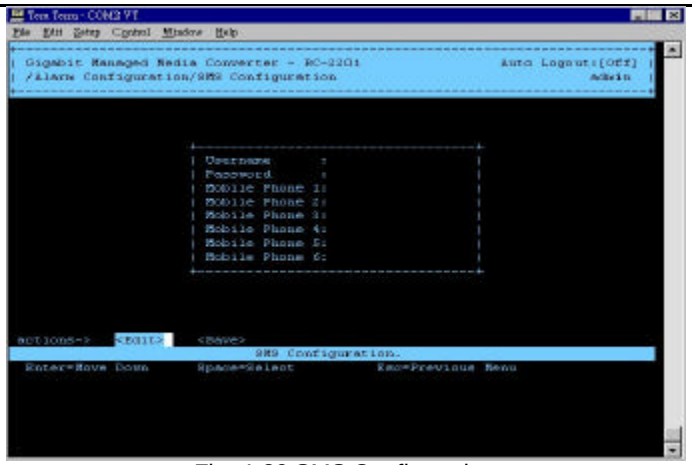


Fig. 4-39 SMS Configuration

4-3-4. Save Configuration

RC-2201/02 supports three copies of configuration, including default configuration, working configuration and user configuration for your configuration management. All of them are listed and described below respectively.

- **Default Configuration:**

  This is the ex-factory setting and cannot be altered.

- **Working Configuration:**

  It is the configuration you are using currently and can be changed any time. The configurations you are using are saved into this configuration file. This is updated each time as you select **<Save>** item.

- **User Configuration:**

  It is the configuration file for the specified or backup purposes and can be updated while having confirmed the configuration. You can retrieve it by performing Restore User Configuration.

Function name:

Save As User Configuration

Function description:

Save As User Configuration function can save the current configuration as a user configuration file in flash memory.

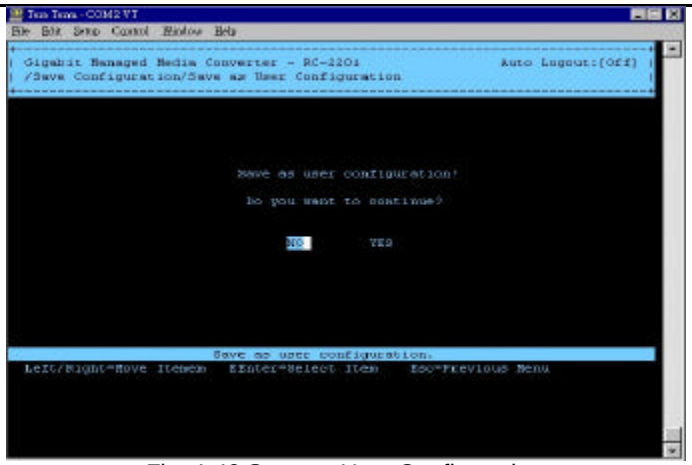

Tera Term - COM2 VT
File Edit Setup Control Window Help
Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/Save Configuration/Save as User Configuration
Save as user configuration!
Do you want to continue?
NO
YES
Save as user configuration.
Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-40 Save as User Configuration

Function name:

Restore Default Configuration

Function description:

Restore Default Configuration function can retrieve the Ruby's setting to replace the working configuration.

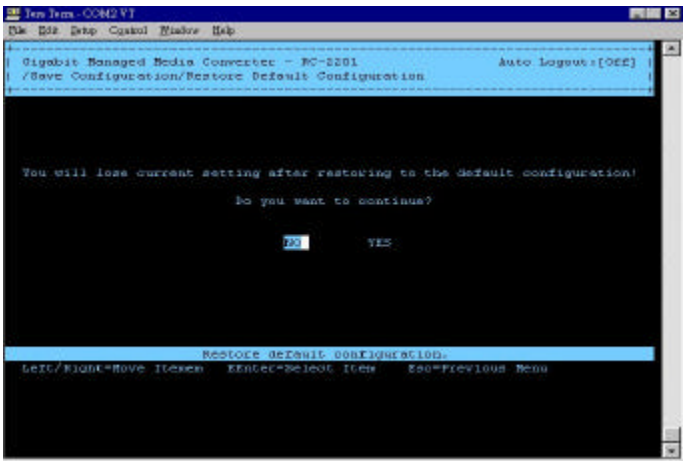

Tera Term - COM2 VT
File Edit Setup Control Window Help
Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/Save Configuration/Restore Default Configuration
You will lose current setting after restoring to the default configuration!
Do you want to continue?
NO
YES
Restore default configuration.
Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-41 Restore Default Configuration

Function name:

Restore User Configuration

Function description:

Restore User Configuration function can retrieve the previous confirmed working configuration stored in the flash memory to update user's current working configuration. When completing to restore the configuration, the system's working configuration is updated and will be changed its working mode by the new configuration immediately.

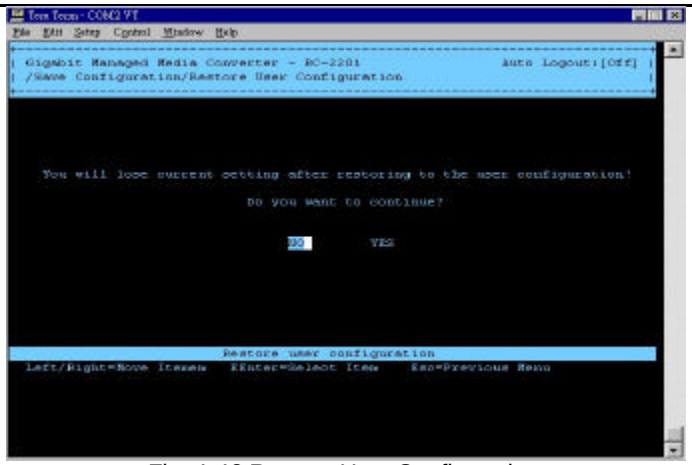


Fig. 4-42 Restore User Configuration

4-4. Diagnostics

Function name:

Diagnostics

Function description:

Diagnostics function provides a set of basic system diagnosis. It let users know that whether the system is health or needs to be fixed. The basic system check includes UART test, DRAM test, Flash test, Temperature detection, Case detection and Fan RPM detection.

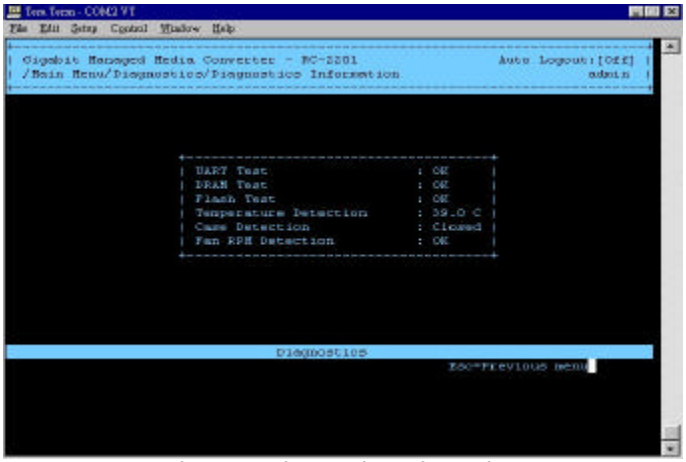


Fig. 4-43 Diagnostics Information

Function name:

Loopback Test

Function description:

In the Loopback Test function, there are two different loopback tests. One is Internal Loopback Test and the other is External Loopback Test. The former test function will not send the test signal outside the RC-2201/02. The test signal only wraps around in the RC-2201/02. As to the latter test function, it will send the test signal to its link partner. If you do not have them connected to active network devices, i.e. the ports are link down, RC-2201/02 will report the port numbers failed. If they all are ok, it just shows OK.

Note: Whatever you choose Internal Loopback Test or External Loopback Test, these two functions will interfere with the normal system working, and all packets in sending and receiving also will stop temporarily.

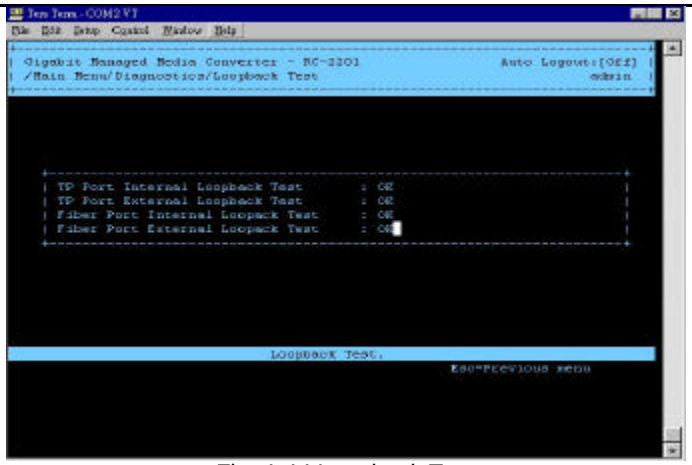

Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/Main Menu/Diagnostics/Loopback Test
admin
TP Port Internal Loopback Test : OK
TP Port External Loopback Test : OK
Fiber Port Internal Loopback Test : OK
Fiber Port External Loopback Test : OK
Loopback Test.
Esc=Previous menu

Fig. 4-44 Loopback Test

Function name:

Ping Test

Function description:

Ping Test function is a tool for detecting if the target device is alive or not through ICMP protocol which abounds with report messages. RC-2201/02 provides Ping Test function to let you know that if the target device is available or not. You can simply fill in a known IP address and then press **<Enter>** key. After a few seconds later, RC-2201/02 will report you the pinged device is alive or dead.

Parameter description:

IP Address: an IP address with the version of v4, e.g. 192.168.1. 254.

Default Gateway: IP address of the default gateway.

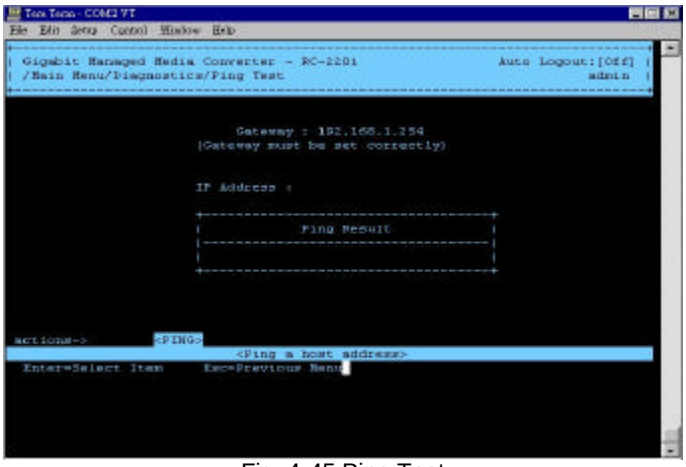


Fig. 4-45 Ping Test

Function name:

Auto Ping Configuration

Function description:

Auto Ping Configuration is used to test one or two target devices periodically

with a period of time, which is programmable. This can detect that if the target device or the device itself is dead, and it helps you debug the network problems. RC-2201/02 can auto-ping two network devices at the same time.

Parameter description:

Ping Time Interval:

This parameter is used to instruct RC-2201/02 periodically pinging the target device with the time interval you assigned. Programmable time range: 1 – 60 minutes.

Default: 10 minutes.

Host IP Address and Gateway:

These are IP addresses with the format of version 4.

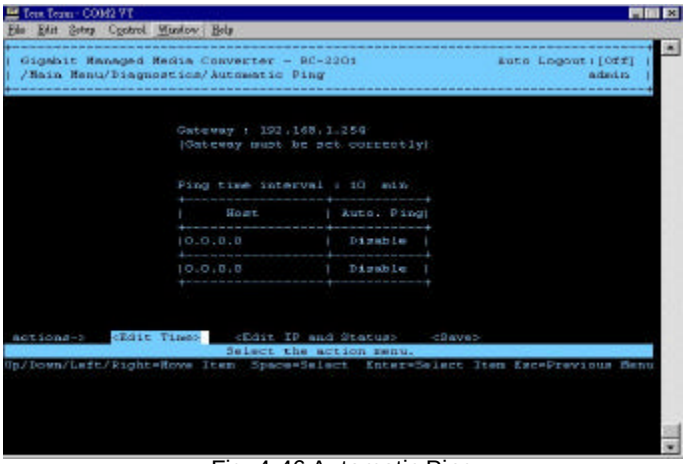


Fig. 4-46 Automatic Ping

4-5. Show Log Data

This function shows the log data. RC-2201/02 provides three types of log data for users, including trap log, illegal access log and MAC Alias, in which illegal access log is reported in the Illegal Access Report. RC-2201/02 supports total 60 log entries. For more details on log items, please refer to the section of Trap/Alarm Configuration and SNMP Configuration. User logs include user login and logout.

Function name:

Trap Log Data

Function description:

The Trap Log Data is displaying the log items including all SNMP Private Trap events, SNMP Public traps and user logs occurred in the system. In the report table, No., Time and Events are three fields contained in each trap record.

Parameter description:

No:

Display the order number that the trap happened.

Time:

Display the time that the trap happened.

Events:

Display the trap event name.

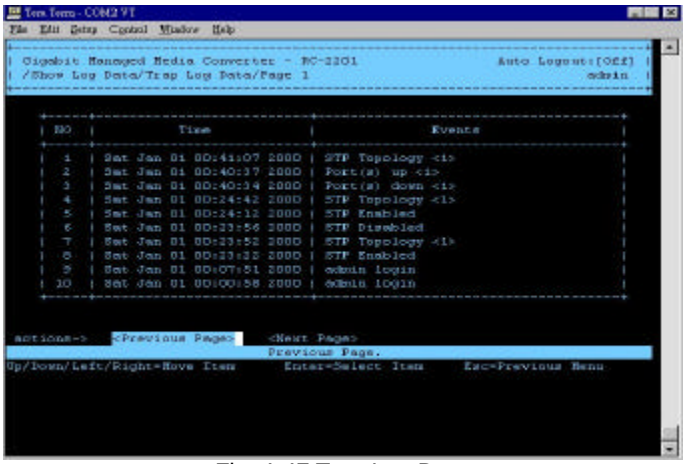

Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/Show Log Data/Trap Log Data/Page 1
admin
NO
Time
Events
1 Sat Jan 01 0D:41:07 200D STP Topology <1>
2 Sat Jan 01 0D:40:37 200D Port(s) up <1>
3 Sat Jan 01 0D:40:34 200D Port(s) down <1>
4 Sat Jan 01 0D:24:42 200D STP Topology <1>
5 Sat Jan 01 0D:24:12 200D STP Enabled
6 Sat Jan 01 0D:23:56 200D STP Disabled
7 Sat Jan 01 0D:23:52 200D STP Topology <1>
8 Sat Jan 01 0D:23:32 200D STP Enabled
9 Sat Jan 01 0D:07:51 200D admin login
10 Sat Jan 01 0D:00:58 200D admin login
action-> <Previous Page> <Next Page>
Previous Page.
Up/Down/Left/Right=Move Item
Enter=Select Item
Esc=Previous Menu

Fig. 4-47 Trap Log Data

Function name:

Illegal Access Report

Function description:

The Illegal Access Report function is to display the unauthorized users accessing RC-2201/02. If Allowed forwarding or Denied forwarding was configured, Illegal Access Report starts recording which illegal user(s) try to access. At this moment, illegal users will be rejected to serve in RC-2201/02. This can highly improve network security and traffic management.

In this table, RC-2201/02 records those users who violate Allowed Forwarding rule and Denied Forwarding rule. Besides, illegal access report can also show the alias name of users, instead of MAC address only, if you configured MAC alias name in advance.

Each entry in illegal access report comprises six fields, including record order number, Source Address, Destination Address, port number, time and type. RC-201/02 supports 32 record entries for illegal access report by applying ring structure. That means if there is no room for the new record, it will overwrite the oldest record in the ring.

Parameter description:

SA: MAC Source Address.

DA: MAC Destination Address.

*Port: Display the p*ort number that the illegal access happened.

Time: Current System Time.

Reason: Violating Allowed Table or Violating Denied Table.

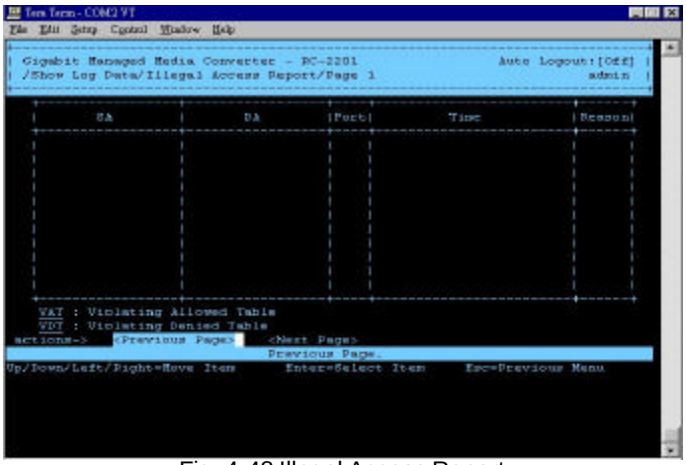


Fig. 4-48 Illegal Access Report

Function name:

MAC Alias

Function description:

MAC Alias function is used to let you assign MAC address a plain English name, which will help you tell which MAC address belongs to which user in the illegal access report. At the initial time, it shows all pairs of the existed alias name and MAC address.

There are three MAC alias functions in this function folder, including Create New Entry, Edit/ Delete Entry. You can add a new alias name for a specified MAC address in Create New Entry function, or mark an existed entry to edit/delete it in Edit/ Delete Entry function as well. Alias name must be composed of A-Z, a-z and 0-9 only and has a maximal length of 17 characters.

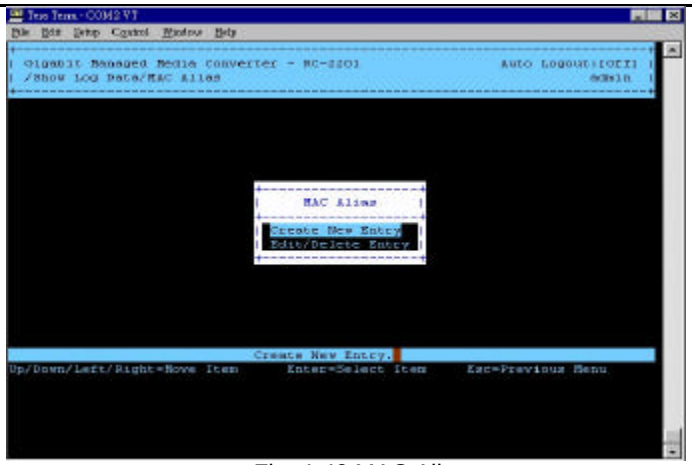


Fig. 4-49 MAC Alias

Function name:

Create New Entry

Function description:

In the MAC Alias function, it is used to let you add an association between MAC address and a plain English name. User can move the cursor to **<Edit>** and press **<Enter>** key to add a new record with name.

Parameter description:

MAC Address:

New Entry:

If you want to apply a name to a MAC address which does not exist in the MAC address table, you must choose New Entry to fill in the MAC address by yourself or select a MAC address in the MAC address table, and then assign it an alias name for mnemonic name.

Alias:

MAC alias name you assign.

Note: If there are too many MAC addresses learned in the table, we recommend you inputting the MAC address and alias name directly.

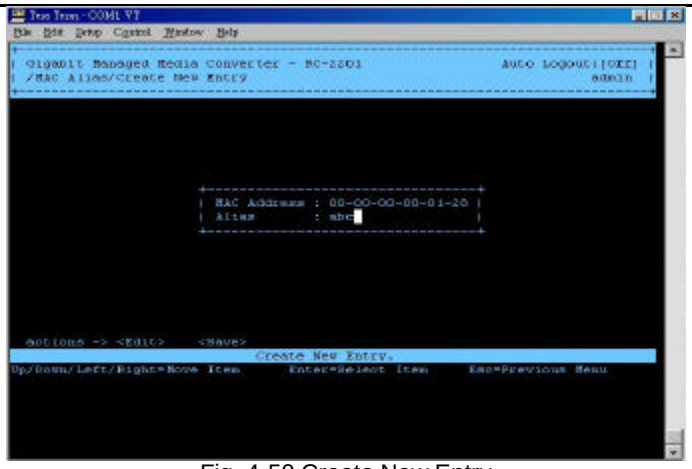


Fig. 4-50 Create New Entry

Function name:

Edit/Delete Entry (MAC Alias)

Function description:

MAC Alias Edit/Delete function is used to let you modify/remove an alias name to a MAC address. You can select an existed MAC address or alias name to modify/remove.

Parameter description:

MAC Address:

The Ethernet MAC address of end station.

Alias:

A mnemonic name for the end station.

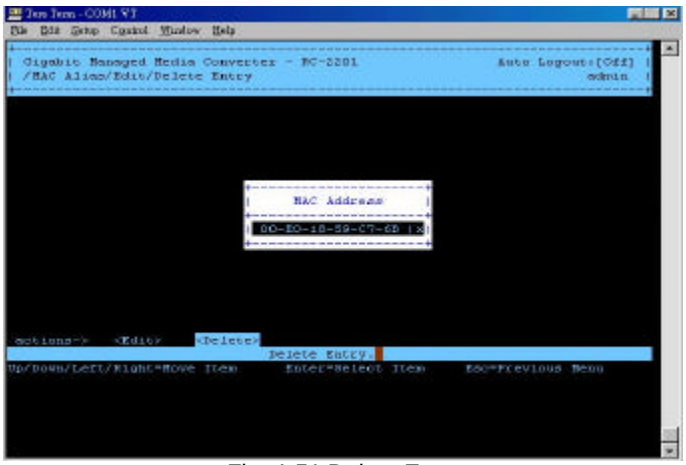


Fig. 4-51 Delete Entry

4-6. Software Upgrade

Software upgrade tool is used to help upgrade the software function in order to fix or improve the function. RC-2201/02 provides a TFTP client for software upgrade. This can be done through Ethernet.

Function name:

Software Upgrade

Function description:

RC-2201/02 supports TFTP upgrade tool for upgrading software. If you assure to upgrade software to a newer version one, you must follow two procedures:

3.) Specifying the IP address where TFTP server locates. In this field, the IP address of your TFTP server should be filled in.

4.) Specifying what is the filename and where is the file. You must specify full path and filename.

Once you select **<Upgrade>** item, RC-2201/02 will prompt the screen for you to reconfirm. Then, RC-2201/02 starts downloading software from TFTP server if you choose **<Yes>** button. It will be just back to "Software Upgrade" if you choose **<No>**.

If your download is not successful, RC-2201/02 will also be back to "Software Upgrade", and it will not upgrade the software as well.

When download is completed, RC-2201/02 starts upgrading software. A reboot message will be prompted after completing upgrading software. At this time, you must reboot RC-2201/02 to have new software worked.

Note: Software upgrade is hazardous if power is off. You must do it carefully.

Parameter description:

TFTP Server:

A TFTP server stored the image file you want to upgrade.

Path and Filename:

File path and filename stored the image file you want to upgrade.

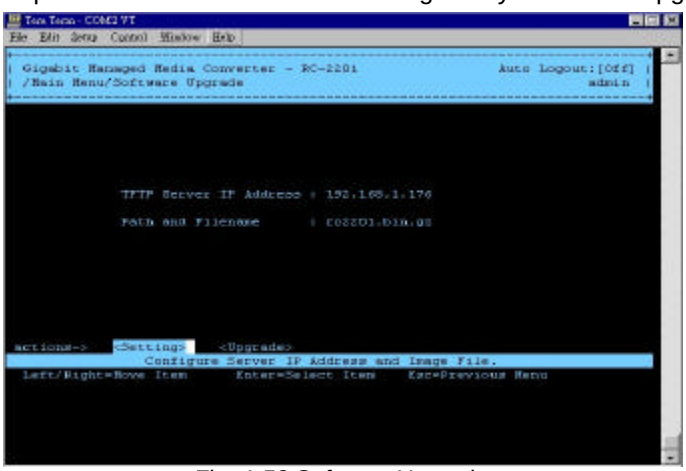

Gigabit Managed Media Converter - RC-2201
Auto Logout:[Off]
/Main Menu/Software Upgrade
admin
TFTP Server IP Address : 192.168.1.176
Path and Filename : rc2201.bin.03
actions-> <Setting> <Upgrade>
Configure Server IP Address and Image File.
Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-52 Software Upgrade

4-7. Reboot

We offer you many ways to reboot RC-2201/02, including power up, hardware reset and software reset. You can press the RESET button in the front panel to reset RC-2201/02. After upgrading software or changing IP configuration, then you must reboot to have the new configuration taken effect. Here we are discussing is software reset for the "reboot" in the main menu.

Function name:

Reboot

Function description:

Reboot RC-22201/02. Reboot takes the same effect as the RESET button on the front panel of RC-2201/02 Converter. It will take around thirty (30) seconds to complete the system boot.

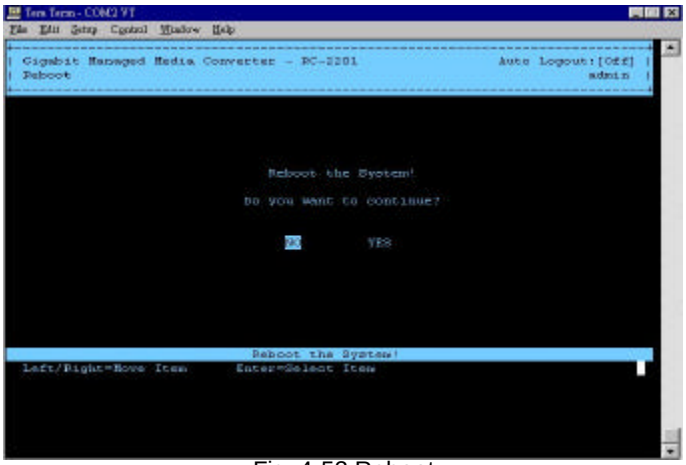


Fig. 4-53 Reboot

4-8. Logout

You can manually logout by performing Logout function. In RC-2201/02, it provides another way to logout. You can configure it to logout automatically.

Function name:

Logout

Function description:

RC-2201/02 allows you to logout the system to prevent other users from the system without the permission. If you do not logout and exit the browser, RC-2201/02 will automatically have you logout. Besides this manually logout and implicit logout, you can press **<Tab>** to explicitly ON/OFF this logout function at the right-top corner.

Parameter description:

Auto Logout:

Select On/OFF. Default is ON. If it is "ON", and no action and no key is stroke as well in any function screen more than 3 minutes, RC-2201/02 will have you logout automatically.

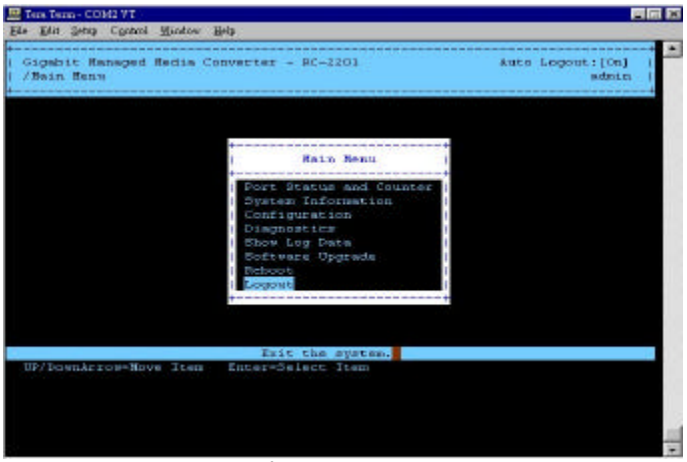


Fig. 4-54 Logout

Appendix A
MIB Specifications

The Managed Media converter supports SNMP. MIB II Enterprise MIB brief description is listed as below. A MIB file in a readable electronic media (floppy disk or CD-ROM) is packed with the product box. For technical support/download, please visit our web site http://www.rubytech.com.tw.

```
RUBYTECH-RC2201-MIB DEFINITIONS ::=BEGIN

IMPORTS
   enterprises,Counter, TimeTicks, Gauge          FROM RFC1155-SMI
   mib-2, DisplayString                           FROM RFC1213-MIB
   TRAP-TYPE                                      FROM RFC-1215
   OBJECT-TYPE                                    FROM RFC-1212;

Rubytech            OBJECT IDENTIFIER ::= { enterprises 5205 }

MediaConverter      OBJECT IDENTIFIER ::= { Rubytech 1 }
ProductsShared      OBJECT IDENTIFIER ::= { Rubytech 100 }

RC2201ProductId     OBJECT IDENTIFIER ::= { MediaConverter 9 }
RubyCommonMIB           OBJECT IDENTIFIER ::= { ProductsShared 1 }

CommonSys           OBJECT IDENTIFIER ::= { RubyCommonMIB 1 }

Reboot OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    ruby_common_sys
        DESCRIPTION
                "This is a reboot trigger if you set 1 to the OID.
                range (0|1)
                        0 - no effect
                        1 - reboot  "
        ::= { CommonSys 1 }

TimeSync OBJECT-TYPE
        SYNTAX              TimeTicks
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    ruby_common_sys
        DESCRIPTION
                "For synchronizing the system time with UTC or any source, or
getting
                it back. The expression of seconds is the same as UTC."
        ::= { CommonSys 2 }

IPAssignment OBJECT-TYPE
        SYNTAX              IpAddress
        MAX-ACCESS  read-write
        STATUS              current
```

```
--          @@ACTION    ruby_common_sys
            DESCRIPTION
                  "Get/Set the IP address of the system."
            ::= { CommonSys 3 }

NetMaskAssignment     OBJECT-TYPE
            SYNTAX                IpAddress
            MAX-ACCESS  read-write
            STATUS                current
--          @@ACTION    ruby_common_sys
            DESCRIPTION
                  "Get/Set the Subnet Mask of the system."
            ::= { CommonSys 4 }

DefaultGW       OBJECT-TYPE
            SYNTAX                IpAddress
            MAX-ACCESS  read-write
            STATUS                current
--          @@ACTION    ruby_common_sys
            DESCRIPTION
                  "Get/Set the default gateway of the system."
            ::= { CommonSys 5 }

DNS OBJECT-TYPE
            SYNTAX                IpAddress
            MAX-ACCESS  read-write
            STATUS                current
--          @@ACTION    ruby_common_sys
            DESCRIPTION
                  "Get/Set the DNS server of the system."
            ::= { CommonSys 6 }

ProductIDAndSN          OBJECT-TYPE
            SYNTAX                DisplayString
            MAX-ACCESS  read-only
            STATUS                current
--          @@ACTION    ruby_common_sys
            DESCRIPTION
                  "Get the product ID and serial number that are combined by '-'
sign."
            ::= { CommonSys 7 }

SoftwareVersion           OBJECT-TYPE
            SYNTAX                DisplayString
            MAX-ACCESS  read-only
            STATUS                current
--          @@ACTION    ruby_common_sys
            DESCRIPTION
                  "Get the software version of the system."
            ::= { CommonSys 8 }

HardwareVersion           OBJECT-TYPE
            SYNTAX                DisplayString
            MAX-ACCESS  read-only
            STATUS                current
```

```
--          @@ACTION     ruby_common_sys
            DESCRIPTION
                  "Get the hardware version of the system."
            ::= { CommonSys 9 }

MechanicalVersion OBJECT-TYPE
            SYNTAX                  DisplayString
            MAX-ACCESS  read-only
            STATUS                  current
--          @@ACTION     ruby_common_sys
            DESCRIPTION
                  "Get the mechanical version of the system."
            ::= { CommonSys 10 }

BIOSVsersion   OBJECT-TYPE
            SYNTAX                  DisplayString
            MAX-ACCESS  read-only
            STATUS                  current
--          @@ACTION     ruby_common_sys
            DESCRIPTION
                  "Get the BIOS version of the system."
            ::= { CommonSys 11 }

GetCommunityName     OBJECT-TYPE
            SYNTAX                  DisplayString
            MAX-ACCESS  read-write
            STATUS                  current
--          @@ACTION     ruby_common_sys
            DESCRIPTION
                  "Get/Set the the get community name."
            ::= { CommonSys 12 }

SetCommunityName     OBJECT-TYPE
            SYNTAX                  DisplayString
            MAX-ACCESS  read-write
            STATUS                  current
--          @@ACTION     ruby_common_sys
            DESCRIPTION
                  "Get/Set the the set community name."
            ::= { CommonSys 13 }
-------------------------------------------------------------------------------
FileTransfer      OBJECT IDENTIFIER ::= { RubyCommonMIB 2 }

TFTPServer      OBJECT-TYPE
            SYNTAX                  IpAddress
            MAX-ACCESS  read-write
            STATUS                  current
--          @@ACTION     common_ftp
            DESCRIPTION
                  "Get/set the tftp server IP address."
            ::= { FileTransfer 1 }

FTPServer                  OBJECT-TYPE
            SYNTAX                  IpAddress
            MAX-ACCESS  read-write
```

```
        STATUS              current
--      @@ACTION    common_ftp
        DESCRIPTION
                "Get/set the ftp server IP address."
        ::= { FileTransfer 2 }

FTPUserName         OBJECT-TYPE
        SYNTAX              DisplayString
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    common_ftp
        DESCRIPTION
                "Get/set the username that authorized by ftp server."
        ::= { FileTransfer 3 }

FTPPasswd           OBJECT-TYPE
        SYNTAX              DisplayString
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    common_ftp
        DESCRIPTION
                "Get/set the password that authorized by ftp server."
        ::= { FileTransfer 4 }

FileTransferMethod  OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    common_ftp
        DESCRIPTION
                "Select the File Transfer Method.
                range (1|2)
                        1 - use tftp
                        2 - use ftp."
        ::= { FileTransfer 5 }

-----------------------------------------------------------------------------------------
SoftwareUpgrade     OBJECT IDENTIFIER ::= { RubyCommonMIB 3 }

UpdateImageFile     OBJECT-TYPE
        SYNTAX              DisplayString
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    comm_soft_update
        DESCRIPTION
                "Get/set the updating image file name. Including the path."
        ::= { SoftwareUpgrade 1 }

DoKernelImageUpgradeOBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    comm_soft_update
        DESCRIPTION
                "This is a trigger to do image update if you set to 1 to the OID.
```

```
                range (0|1)
                        0 - no effect
                        1 - do kernel image updrade."
        ::= { SoftwareUpgrade 2 }

KernalImageLastUpdateTime   OBJECT-TYPE
        SYNTAX              TimeTicks
        MAX-ACCESS  read-only
        STATUS              current
--      @@ACTION    comm_soft_update
        DESCRIPTION
                "Get the last kernel-image-updating time."
        ::= { SoftwareUpgrade 3 }

-------------------------------------------------------------------------------
Configuration   OBJECT IDENTIFIER ::= { RubyCommonMIB 4 }

NoOfConfiguration       OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-only
        STATUS              current
--      @@ACTION    comm_config_no
        DESCRIPTION
                "The number of configuration sector."
        ::= { Configuration 1 }

ConfigurationImportTable        OBJECT-TYPE
        SYNTAX              SEQUENCE OF ConfigurationImportEntry
        MAX-ACCESS  not-accessible
        STATUS              current
        DESCRIPTION
                "A list of ConfigurationImportEntry. The number of entries is given
by
                the value of NoOfConfiguration."
        ::= { Configuration 2 }


ConfigurationImportEntry ::=
SEQUENCE {
        ConfigurationImportIndex            INTEGER,
        ConfigurationImportFileName     DisplayString,
        DoImportConfiguration   INTEGER,
        LatestUpdateTime            TimeTicks
}

configurationImportEntry        OBJECT-TYPE
        SYNTAX              ConfigurationImportEntry
        MAX-ACCESS  not-accessible
        STATUS              current
        DESCRIPTION
                "An entry includes the configuration import infomation that appied to
a
                particular flash sector."
        ::= { ConfigurationImportTable 1 }
```

```
ConfigurationImportIndex        OBJECT-TYPE
        SYNTAX                  INTEGER
        MAX-ACCESS  read-only
        STATUS                  current
--      @@ACTION    comm_config_importEntry
        DESCRIPTION
                "the index of the flash sector.
                range (1|2)
                0x01    user0 (working)
                0x02    user1"
        ::= { configurationImportEntry 1 }

ConfigurationImportFileName     OBJECT-TYPE
        SYNTAX                  DisplayString
        MAX-ACCESS  read-write
        STATUS                  current
--      @@ACTION    comm_config_importEntry
        DESCRIPTION
                "The importing configuration file name. Include the path."
        ::= { configurationImportEntry 2 }

DoImportConfiguration   OBJECT-TYPE
        SYNTAX                  INTEGER
        MAX-ACCESS  read-write
        STATUS                  current
--      @@ACTION    comm_config_importEntry
        DESCRIPTION
                "This is a trigger to do import configuration if you set to 1 to the OID.
                range (0|1)
                        0 - no effect
                        1 - do kernel image updrade."
        ::= { configurationImportEntry 3 }

LatestUpdateTime        OBJECT-TYPE
        SYNTAX                  TimeTicks
        MAX-ACCESS  read-only
        STATUS                  current
--      @@ACTION    comm_config_importEntry
        DESCRIPTION
                "The configuation file last update time."
        ::= { configurationImportEntry 4 }

ConfigurationExportTable        OBJECT-TYPE
        SYNTAX                  SEQUENCE OF ConfigurationExportEntry
        MAX-ACCESS  not-accessible
        STATUS                  current
        DESCRIPTION
                "A list of ConfigurationExportEntry. The number of entries is given
by
                the value of NoOfConfiguration."
        ::= { Configuration 3 }


ConfigurationExportEntry ::=
SEQUENCE {
```

```
        ConfigurationExportIndex            INTEGER,
        ConfigurationExportFileName     DisplayString,
        DoExportConfiguration   INTEGER
}

configurationExportEntry        OBJECT-TYPE
        SYNTAX                  ConfigurationExportEntry
        MAX-ACCESS  not-accessible
        STATUS                  current
        DESCRIPTION
                "An entry includes the configuration import infomation that appied to
a
                particular flash sector."
        ::= { ConfigurationExportTable 1 }

ConfigurationExportIndex        OBJECT-TYPE
        SYNTAX                  INTEGER
        MAX-ACCESS  read-only
        STATUS                  current
--      @@ACTION    comm_config_exportEntry
        DESCRIPTION
                "the index of the flash sector.
                range (1|2)
                0x01    user0 (working)
                0x02    user1"
        ::= { configurationExportEntry 1 }

ConfigurationExportFileName     OBJECT-TYPE
        SYNTAX                  DisplayString
        MAX-ACCESS  read-write
        STATUS                  current
--      @@ACTION    comm_config_exportEntry
        DESCRIPTION
                "The importing configuration file name. Include the path.
                The default falue is user0, user1...etc. Depending the flash sector
index."
        ::= { configurationExportEntry 2 }

DoExportConfiguration   OBJECT-TYPE
        SYNTAX                  INTEGER
        MAX-ACCESS  read-write
        STATUS                  current
--      @@ACTION    comm_config_exportEntry
        DESCRIPTION
                "This is a trigger to do export configuration if you set to 1 to the OID.
                range (0|1)
                        0 - no effect
                        1 - do kernel image updrade."
        ::= { configurationExportEntry 3 }

--------------------------------------------------------------------------------
Alarm   OBJECT IDENTIFIER ::= { RubyCommonMIB 5 }

SmtpServer      OBJECT-TYPE
        SYNTAX                  IpAddress
```

```
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    comm_alarm_smtp
        DESCRIPTION
                "The SMTP Email Server IP Address."
        ::= { Alarm 1 }

SmtpUsername OBJECT-TYPE
        SYNTAX              DisplayString
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    comm_alarm_smtp
        DESCRIPTION
                "The username for SMTP server."
        ::= { Alarm 2 }

SmtpPasswd          OBJECT-TYPE
        SYNTAX              DisplayString
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    comm_alarm_smtp
        DESCRIPTION
                "The password for SMTP server."
        ::= { Alarm 3 }

NoOfEmailUsers      OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-only
        STATUS              current
--      @@ACTION    comm_alarm_smtp
        DESCRIPTION
                "The number of the Email Users that you want to send the alarm
notification."
        ::= { Alarm 4 }

EmailUserTable OBJECT-TYPE
        SYNTAX              SEQUENCE OF EmailUserEntry
        MAX-ACCESS  not-accessible
        STATUS              current
        DESCRIPTION
                "A list of EmailUserEntry. The number of entries is given by the
value of NoOfEmailUsers."
        ::= { Alarm 5 }

EmailUserEntry ::=
SEQUENCE {
        UserIndex           INTEGER,
        EmailAddress    DisplayString
}

emailUserEntry OBJECT-TYPE
        SYNTAX              EmailUserEntry
        MAX-ACCESS  not-accessible
        STATUS              current
        DESCRIPTION
```

```
                "An entry includes the user index and Email Address."
        ::= { EmailUserTable 1 }

EmailUserIndex OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS  read-only
        STATUS          current
--      @@ACTION    comm_alarm_smtpEntry
        DESCRIPTION
                "The User Index that you want to send alarming E-mail."
        ::= { emailUserEntry 1 }

EmailAddress    OBJECT-TYPE
        SYNTAX          DisplayString
        MAX-ACCESS  read-write
        STATUS          current
--      @@ACTION    comm_alarm_smtpEntry
        DESCRIPTION
                "The User Email Address that you want to send alarming E-mail."
        ::= { emailUserEntry 2 }

SmsIspServer    OBJECT-TYPE
        SYNTAX          IpAddress
        MAX-ACCESS  read-write
        STATUS          current
--      @@ACTION    comm_alarm_sms
        DESCRIPTION
                "The SMS ISP Server IP Address."
        ::= { Alarm 6 }

UserNameForIsp          OBJECT-TYPE
        SYNTAX          DisplayString
        MAX-ACCESS  read-write
        STATUS          current
--      @@ACTION    comm_alarm_sms
        DESCRIPTION
                "The username for SMS server."
        ::= { Alarm 7 }

PasswordForIsp          OBJECT-TYPE
        SYNTAX          DisplayString
        MAX-ACCESS  read-write
        STATUS          current
--      @@ACTION    comm_alarm_sms
        DESCRIPTION
                "The password for SMS server."
        ::= { Alarm 8 }

NoOfMobileUsers         OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS  read-only
        STATUS          current
--      @@ACTION    comm_alarm_sms
        DESCRIPTION
                "The number of the Email Users that you want to send the alarm
```

```
notification."
        ::= { Alarm 9 }

SMSTable        OBJECT-TYPE
        SYNTAX                  SEQUENCE OF SmsUserEntry
        MAX-ACCESS  not-accessible
        STATUS                  current
        DESCRIPTION
                "A list of SmsUserEntry. The number of entries is given by the value
of NoOfMobileUsers."
        ::= { Alarm 10 }

MobileUserEntry ::=
SEQUENCE {
        UserIndex               INTEGER,
        MobilePhoneNo DisplayString
}

mobileUserEntry OBJECT-TYPE
        SYNTAX                  MobileUserEntry
        MAX-ACCESS  not-accessible
        STATUS                  current
        DESCRIPTION
                "An entry includes the user index and mobile phone number."
        ::= { SMSTable 1 }

SMSUserIndex  OBJECT-TYPE
        SYNTAX                  INTEGER
        MAX-ACCESS  read-only
        STATUS                  current
--      @@ACTION    comm_alarm_smsEntry
        DESCRIPTION
                "The user's Index that you want to send alarming sms."
        ::= { mobileUserEntry 1 }

MobilePhoneNo OBJECT-TYPE
        SYNTAX                  DisplayString
        MAX-ACCESS  read-write
        STATUS                  current
--      @@ACTION    comm_alarm_smsEntry
        DESCRIPTION
                "The user's mobile phone number that you want to send alarming
sms."
        ::= { mobileUserEntry 2 }

-------------------------------------------------------------------------------
Trap    OBJECT IDENTIFIER ::= { RubyCommonMIB 6 }

NoOfTrapHost   OBJECT-TYPE
        SYNTAX                  INTEGER
        MAX-ACCESS  read-write
        STATUS                  current
--      @@ACTION    comm_trap_no
        DESCRIPTION
                "The number of the trap hosts."
```

```
        ::= { Trap 1 }

TrapHostTable   OBJECT-TYPE
        SYNTAX          SEQUENCE OF TrapHostEntry
        MAX-ACCESS  not-accessible
        STATUS          current
        DESCRIPTION
                "A list of trap host entry. The number of entries is given by the value
of NoOfTrapHost."
        ::= { Trap 2 }

TrapHostEntry ::=
SEQUENCE {
        TrapHostIndex   INTEGER,
        TrapHostIP      IpAddress,
        TrapHostCommunity       DisplayString
}

trapHostEntry   OBJECT-TYPE
        SYNTAX          TrapHostEntry
        MAX-ACCESS  not-accessible
        STATUS          current
        DESCRIPTION
                "An entry includes the Trap Host related information."
        ::= { TrapHostTable 1 }

TrapHostIndex   OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS  read-only
        STATUS          current
--      @@ACTION    comm_trap_hostEntry
        DESCRIPTION
                "The index of the trap host."
        ::= { trapHostEntry 1 }

TrapHostIP              OBJECT-TYPE
        SYNTAX          IpAddress
        MAX-ACCESS  read-write
        STATUS          current
--      @@ACTION    comm_trap_hostEntry
        DESCRIPTION
                "The trap host IP address."
        ::= { trapHostEntry 2 }

TrapHostCommunity       OBJECT-TYPE
        SYNTAX          DisplayString
        MAX-ACCESS  read-write
        STATUS          current
--      @@ACTION    comm_trap_hostEntry
        DESCRIPTION
                "The trap host community name."
        ::= { trapHostEntry 3 }
```

```
RC2201Produces          OBJECT IDENTIFIER ::= { RC2201ProductId 1 }
TestValue               ::= INTEGER { pass(1), failure(0) }
RC2201SystemMIB                 OBJECT IDENTIFIER ::=
        { RC2201Produces 1 }

RC2201Temperature OBJECT-TYPE
        SYNTAX      DisplayString
        MAX-ACCESS  read-only
        STATUS      current
--      @@ACTION    ruby_sys_mib
        DESCRIPTION
                "Read the value from the temperature sensor. It is a numerical
series
                of 5. There is a difference of 0.5 Celsius degree between a level
and
                its next one."
        ::= { RC2201SystemMIB 1 }

RC2201FanRPM OBJECT-TYPE
        SYNTAX      INTEGER
        MAX-ACCESS  read-only
        STATUS      current
--      @@ACTION    ruby_sys_mib
        DESCRIPTION
                "Return an approximate RPM of the fan1 on the back panel. The
value less
                than or equal to 4200 represents that the fan is operational, else
breakdown."
        ::= { RC2201SystemMIB 2 }

RC2201DevicePort OBJECT-TYPE
        SYNTAX      DisplayString
      MAX-ACCESS  read-only
        STATUS      current
--      @@ACTION    ruby_sys_mib
        DESCRIPTION
                "Get the quantity of ports that this system owns now."
        ::= { RC2201SystemMIB 3 }

RC2201CaseIntrusion OBJECT-TYPE
        SYNTAX      DisplayString
      MAX-ACCESS  read-only
        STATUS      current
--      @@ACTION    ruby_sys_mib
        DESCRIPTION
                "Detect the Case is opened or closed."
        ::= { RC2201SystemMIB 4 }

RC2201UARTTest          OBJECT-TYPE
        SYNTAX      TestValue
        MAX-ACCESS  read-only
        STATUS      current
--      @@ACTION    ruby_sys_mib
        DESCRIPTION
```

```
                "UART test.
                range (0|1)
                1 - pass
                0 - failure  "
        ::= { RC2201SystemMIB 5 }

RC2201DramTest          OBJECT-TYPE
        SYNTAX      TestValue
      MAX-ACCESS  read-only
        STATUS      current
--      @@ACTION    ruby_sys_mib
        DESCRIPTION
                "DRAM read/write test.
                range (0|1)
                1 - pass
                0 - failure  "
        ::= { RC2201SystemMIB 6 }

RC2201FlashChecksumTest OBJECT-TYPE
        SYNTAX      TestValue
      MAX-ACCESS  read-only
        STATUS      current
--      @@ACTION    ruby_sys_mib
        DESCRIPTION
                "Flash memory read test.
                range (0|1)
                1 - pass
                0 - failure  "
        ::= { RC2201SystemMIB 7 }

RC2201InternalLoopbackTest OBJECT-TYPE
        SYNTAX      DisplayString
      MAX-ACCESS  read-only
        STATUS      current
--      @@ACTION    ruby_sys_mib
        DESCRIPTION
                "Do the internal loopback test (from port 1 to port 2). "
        ::= { RC2201SystemMIB 8 }

RC2201ExternalLoopbackTest OBJECT-TYPE
        SYNTAX      DisplayString
      MAX-ACCESS  read-only
        STATUS      current
--      @@ACTION    ruby_sys_mib
        DESCRIPTION
                "Do the external loopback test (from port 1 to port 2). "
        ::= { RC2201SystemMIB 9 }

--------------------------------------------------------------------------------

RC2201PortMIB           OBJECT IDENTIFIER ::=           { RC2201Produces 2 }

RC2201NoOfPort          OBJECT-TYPE
        SYNTAX                  INTEGER
        MAX-ACCESS  read-only
```

```
        STATUS              current
--      @@ACTION    ruby_port_no
        DESCRIPTION
                "Get the port number of the devcie. Include 7 virtual ports. (trunk
group)"
        ::= { RC2201PortMIB 1 }

RC2201PortStatusTable OBJECT-TYPE
        SYNTAX              SEQUENCE OF RC2201PortStatusEntry
        MAX-ACCESS  not-accessible
        STATUS              current
        DESCRIPTION
                "A list of RC2201PortStatusEntry. The number of entries is given by
                the value of RC2201NoOfPort. The privilege of virtual port is read-
only."
        ::= {  RC2201PortMIB 2 }

RC2201PortStatusEntry ::=
SEQUENCE {
        RC2201PortStatusIndex INTEGER,
        RC2201PortState             INTEGER,
        RC2201PortLink              INTEGER,
        RC2201PortNegotiation INTEGER,
        RC2201PortSpeed             INTEGER,
        RC2201PortDuplex      INTEGER,
        RC2201PortFlwCtl      INTEGER,
        RC2201PortTxGoodPkt Counter32,
        RC2201PortTxBadPkt    Counter32,
        RC2201PortRxGoodPkt Counter32,
        RC2201PortRxBadPkt    Counter32,
        RC2201PortTxGoodByte        Counter32,
        RC2201PortRxGoodByte        Counter32,
        RC2201PortTxAbort     Counter32,
        RC2201PortTxCollision Counter32,
        RC2201PortDropPkt     Counter32
}

RC2201portStatusEntry  OBJECT-TYPE
        SYNTAX              RC2201PortStatusEntry
        MAX-ACCESS  not-accessible
        STATUS              current
        DESCRIPTION
                "An entry includes the port status releated infomation."
        ::= { RC2201PortStatusTable 1 }

RC2201PortStatusIndex OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-only
        STATUS              current
--      @@ACTION    ruby_portEntry
        DESCRIPTION
                "The index of the port."
        ::= { RC2201portStatusEntry 1 }

RC2201PortState         OBJECT-TYPE
```

```
        SYNTAX              INTEGER
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    ruby_portEntry
        DESCRIPTION
                "Get/Set the on/off state of the designated port.
                Port state of virtual is on if the trunk group is enabled.
                range (0|1)
                0 - Off
                1 - On  "
        ::= { RC2201portStatusEntry 2 }

RC2201PortLink      OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-only
        STATUS              current
--      @@ACTION    ruby_portEntry
        DESCRIPTION
                "Get the link state of the designated port.
                Link state of virtual port is up if one of group members is link up.
                range (0|1)
                0 - Down
                1 - Up  "
        ::= { RC2201portStatusEntry 3 }

RC2201PortNegotiation OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    ruby_portEntry
        DESCRIPTION
                "Get/Set the negotiation setting of the designated port.
                Virtual port is always in auto mode.
                range (0|1)
                0 - Force
                1 - Auto "
        ::= { RC2201portStatusEntry 4 }

RC2201PortSpeed     OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    ruby_portEntry
        DESCRIPTION
                "Get/Set the speed mode of the designated port.
                range (0|1|2)
                0 - 10Mb
                1 - 100Mb
                2 - 1Gb (only for port 1, 2)
                Access mode of virtual port is read-only.
                The unit of virtual port is megabyte (MB)"
        ::= { RC2201portStatusEntry 5 }

RC2201PortDuplex    OBJECT-TYPE
        SYNTAX              INTEGER
```

```
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    ruby_portEntry
        DESCRIPTION
                "Get/Set the duplex mode of the designated port.
                Virtual port is always in full duplex mode.
                range (0|1)
                0 - Half
                1 - Full"
        ::= { RC2201portStatusEntry 6 }

RC2201PortFlwCtl    OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-write
        STATUS              current
--      @@ACTION    ruby_portEntry
        DESCRIPTION
                "Get/Set the Flow Control mode of the designated port. In the half
duplex mode,
                the flow control state always BackPressure. State of virtual port is
always enabled.
                range(0|1|2|3)
                Get:
                0 - Disable, 1 - Enable  ,2 - TX pauss, 3 - RX pause
                Set:
                0 - Disable, 1 - Symmetric, 2 - Asymmetric, 3 - BackPressure(for
half duplex mode only)."
        ::= { RC2201portStatusEntry 7 }

RC2201PortTxGoodPkt OBJECT-TYPE
        SYNTAX              Counter32
        MAX-ACCESS  read-only
        STATUS              current
--      @@ACTION    ruby_portEntry
        DESCRIPTION
                "Get the current counter of total Tx good packets on the designated
port since
                system boot-up."
        ::= { RC2201portStatusEntry 8 }

RC2201PortTxBadPkt  OBJECT-TYPE
        SYNTAX              Counter32
        MAX-ACCESS  read-only
        STATUS              current
--      @@ACTION    ruby_portEntry
        DESCRIPTION
                "Get the current counter of total Tx bad packets on the designated
port since
                system boot-up."
        ::= { RC2201portStatusEntry 9 }

RC2201PortRxGoodPkt OBJECT-TYPE
        SYNTAX              Counter32
        MAX-ACCESS  read-only
        STATUS              current
```

```
--          @@ACTION      ruby_portEntry
            DESCRIPTION
                        "Get the current counter of total Rx good packets on the designated
port since
                        system boot-up."
            ::= { RC2201portStatusEntry 10 }

RC2201PortRxBadPkt    OBJECT-TYPE
            SYNTAX                  Counter32
            MAX-ACCESS  read-only
            STATUS                  current
--          @@ACTION      ruby_portEntry
            DESCRIPTION
                        "Get the current counter of total Rx bad packets on the designated
port since
                        system boot-up."
            ::= { RC2201portStatusEntry 11 }

RC2201PortTxGoodByte          OBJECT-TYPE
            SYNTAX                  Counter32
            MAX-ACCESS  read-only
            STATUS                  current
--          @@ACTION      ruby_portEntry
            DESCRIPTION
                        "Get the current counter of total bytes within Tx good packets on
the designated
                        port since system boot-up."
            ::= { RC2201portStatusEntry 12 }

RC2201PortRxGoodByte          OBJECT-TYPE
            SYNTAX                  Counter32
            MAX-ACCESS  read-only
            STATUS                  current
--          @@ACTION      ruby_portEntry
            DESCRIPTION
                        "Get the current counter of total bytes within Rx good packets on
the designated
                        port since system boot-up."
            ::= { RC2201portStatusEntry 13 }

RC2201PortTxAbort       OBJECT-TYPE
            SYNTAX                  Counter32
            MAX-ACCESS  read-only
            STATUS                  current
--          @@ACTION      ruby_portEntry
            DESCRIPTION
                        "Get the current counter of total error packets on the designated
port since
                        system boot-up."
            ::= { RC2201portStatusEntry 14 }

RC2201PortTxCollision OBJECT-TYPE
            SYNTAX                  Counter32
            MAX-ACCESS  read-only
            STATUS                  current
```

```
--          @@ACTION     ruby_portEntry
            DESCRIPTION
                        "Get the current counter of total collision packets on the designated
port since
                        system boot-up."
            ::= { RC2201portStatusEntry 15 }

RC2201PortDropPkt      OBJECT-TYPE
            SYNTAX                  Counter32
            MAX-ACCESS  read-only
            STATUS                  current
--          @@ACTION     ruby_portEntry
            DESCRIPTION
                        "Get the current counter of total drop packets on the designated
port since
                        system boot-up."
            ::= { RC2201portStatusEntry 16 }

----- Popular Function MIB -----

RC2201PopularFuncMIB OBJECT IDENTIFIER ::= { RC2201Produces 3}

RC2201NTPTimeSync   OBJECT-TYPE
            SYNTAX                  INTEGER
            MAX-ACCESS  read-write
            STATUS                  current
--          @@ACTION     ruby_popular_func
            DESCRIPTION
                        "Sync time from NTP Server. The return value is always 0.
                        Setting the Time Server and TimeZone before doing time sync.
                        value range (1|0):
                        1 - sync,
                        0 - don't sync time from NTP. "
            ::= { RC2201PopularFuncMIB 1}

RC2201MaxPacketLength       OBJECT-TYPE
            SYNTAX                  INTEGER
            MAX-ACCESS  read-write
            STATUS                  current
--          @@ACTION     ruby_popular_func
            DESCRIPTION
                        "Get/Set the Maximun Packet Length (1522/1536 bytes).
                        value range (1|0)
                        1 - 1536 bytes,
                        0 - 1522 bytes "
            ::= { RC2201PopularFuncMIB 2}

RC2201BrocastSupressOBJECT-TYPE
            SYNTAX                  INTEGER
            MAX-ACCESS  read-write
            STATUS                  current
--          @@ACTION     ruby_popular_func
            DESCRIPTION
                        "Get/Set the Brocast Suppression Status.
                        value range (0 - 30)
```

```
                0 : disabled,
                1 - 30 : enabled and the setting time (sec). "
        ::= { RC2201PopularFuncMIB 3}

RC2201BrocastStormFiltering   OBJECT-TYPE
        SYNTAX                INTEGER
        MAX-ACCESS  read-write
        STATUS                current
--      @@ACTION    ruby_popular_func
DESCRIPTION
                "Get/Set Brocast Storm Filtering Mode.
                range (0-5)
                0 - don't filter brocast,
                1 - filter brocast packet if the brocast packets in the buffer is over
5%,
                2 - filter brocast packet if the brocast packets in the buffer is over
10%,
                3 - filter brocast packet if the brocast packets in the buffer is over
15%,
                4 - filter brocast packet if the brocast packets in the buffer is over
20%,
                5 - filter brocast packet if the brocast packets in the buffer is over
25% . "
        ::= { RC2201PopularFuncMIB 4}

RC2201PrioriyQueueService     OBJECT-TYPE
        SYNTAX                INTEGER
        MAX-ACCESS  read-write
        STATUS                current
--      @@ACTION    ruby_popular_func
        DESCRIPTION
                "Get/Set Priority Queue Method.
                 value range (0|1|2)
                 0 - first come first service,
                 1 - all high before low,
                 2 - weight round robin.  "
        ::= { RC2201PopularFuncMIB 5}

RC2201HighWeight      OBJECT-TYPE
        SYNTAX        INTEGER
        MAX-ACCESS  read-write
        STATUS        current
--      @@ACTION    ruby_popular_func
        DESCRIPTION
                "Get/Set high weight value (co-operated with low weight).
                This function is only for weight round robin. Always return 0 if the
operaion of
                priority queue service isn't WRR.
                The value of high weight must be higher than the value of low
weight.
                value range (1 - 7). "
        ::= { RC2201PopularFuncMIB 6}

RC2201LowWeight       OBJECT-TYPE
        SYNTAX        INTEGER
```

```
        MAX-ACCESS  read-write
        STATUS      current
--      @@ACTION    ruby_popular_func
        DESCRIPTION
                "Get/Set low weight value (co-operated with high weight).
                This function is only for weight round robin.
                value range (1 - 7). "
        ::= { RC2201PopularFuncMIB 7}

RC2201QoSPrioriyLevelSeting  OBJECT-TYPE
        SYNTAX      INTEGER
        MAX-ACCESS  read-write
        STATUS      current
--      @@ACTION    ruby_popular_func
        DESCRIPTION
                "Get/Set the High Priority level. The value is a mask.
                bit0 means level 0, bit1 means level 1, ..., and so on.
                range ( 0 - 128)"
        ::= { RC2201PopularFuncMIB 8}

RC2201MaxBridgeTransmitDelayBound OBJECT-TYPE
        SYNTAX      INTEGER
        MAX-ACCESS  read-write
        STATUS      current
--      @@ACTION    ruby_popular_func
        DESCRIPTION
                "Get/Set the Maximun Bridge Transmit Delay Bnd.
                value ragne (0|1|2|3)
                0 - 1 sec,
                1 - 2 secs,
                2 - 4 secs,
                3 - Off"
        ::= { RC2201PopularFuncMIB 9}

RC2201MaxDelayTime  OBJECT-TYPE
        SYNTAX      INTEGER
        MAX-ACCESS  read-write
        STATUS      current
--      @@ACTION    ruby_popular_func
        DESCRIPTION
                "Get/Set the Maximun Delay Bound.
                We must enable the max bridge transmit delay bound before
ebabling the max delay time.
                value range (0-255)
                0 - disable delay bound
                1 - delay 1 ms,
                2 - delay 2 ms,
                3 - delay 3 ms,
                ... and so on."
        ::= { RC2201PopularFuncMIB 10}

RC2201PowerDownSetting      OBJECT-TYPE
        SYNTAX              INTEGER
        MAX-ACCESS  read-write
        STATUS              current
```

```
--          @@ACTION      ruby_popular_func
            DESCRIPTION
                  "Get/Set the Power Down automatically when the fan stopped,
                  and temperature is over 60 degrees"
            ::= { RC2201PopularFuncMIB 11 }

---- Auto Ping Function ----

RC2201AutoPingMIB     OBJECT IDENTIFIER ::=          { RC2201Produces 5 }

RC2201AutoPingInterval          OBJECT-TYPE
            SYNTAX                  INTEGER
            MAX-ACCESS  read-write
            STATUS                  current
--          @@ACTION      ruby_AutoPing
            DESCRIPTION
                  "Get/Set the auto ping time inteval. (mins).
                  value range (1 - 60)"
            ::= { RC2201AutoPingMIB 1 }

RC2201AutoPingGroupNo         OBJECT-TYPE
            SYNTAX                  INTEGER
            MAX-ACCESS  read-only
            STATUS                  current
--          @@ACTION      ruby_AutoPing
            DESCRIPTION
                  "Get the amount of auto ping group."
            ::= { RC2201AutoPingMIB 2 }

RC2201AutoPingTable   OBJECT-TYPE
            SYNTAX                  SEQUENCE OF RC2201AutoPingEntry
            MAX-ACCESS  not-accessible
            STATUS                  current
            DESCRIPTION
                  "A list of Autoping function entries. The number of entries is given
by the
                  value of the RC2201AutoPingGroupNo. "
            ::= { RC2201AutoPingMIB 3 }

RC2201AutoPingEntry ::=
SEQUENCE {
            RC2201AutoPingIndex   INTEGER,
            RC2201AutoPingDestIp  IpAddress
}

RC2201autoPingEntry   OBJECT-TYPE
            SYNTAX                  RC2201AutoPingEntry
            MAX-ACCESS  not-accessible
            STATUS                  current
            ::= { RC2201AutoPingTable 1 }

RC2201AutoPingIndex   OBJECT-TYPE
            SYNTAX                  INTEGER
            MAX-ACCESS  read-only
            STATUS                  current
```

```
--          @@ACTION      ruby_AutoPing_Entry
            DESCRIPTION
                  "Get the index of AutoPing."
            ::= { RC2201autoPingEntry 1 }

RC2201AutoPingDestIp OBJECT-TYPE
            SYNTAX              IpAddress
            MAX-ACCESS  read-write
            STATUS              current
--          @@ACTION      ruby_AutoPing_Entry
            DESCRIPTION
                  "Get/Set the IP Address of destination of AutoPing ."
            ::= { RC2201autoPingEntry 2 }

-- Trap Event Configuration Function
-------------------------------------------------------------------
RC2201TrapEventConfMIB      OBJECT IDENTIFIER ::= { RC2201Produces 6 }

RC2201ColdStart       OBJECT-TYPE
            SYNTAX          INTEGER
            MAX-ACCESS  read-write
            STATUS          current
--          @@ACTION      ruby_trapconf_mib
            DESCRIPTION
                  "Get/Set the cold-start status of E-mail, SMS and trap configuration.
                  We use a 3-bit mask to present the status.
                  bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                  If you want to send the E-mail alarm and trap, set the oid value with
5.
                  value range (1 - 7)."
            ::= { RC2201TrapEventConfMIB 1 }

RC2201WarmStart       OBJECT-TYPE
            SYNTAX          INTEGER
            MAX-ACCESS  read-write
            STATUS          current
--          @@ACTION      ruby_trapconf_mib
            DESCRIPTION
                  "Get/Set the warm-start status of E-mail, SMS and trap
configuration.
                  We use a 3-bit mask to present the status.
                  bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                  If you want to send the E-mail alarm and trap, set the oid value with
5.
                  value range (1 - 7)."
            ::= { RC2201TrapEventConfMIB 2 }

RC2201LinkDown        OBJECT-TYPE
            SYNTAX          INTEGER
            MAX-ACCESS  read-write
            STATUS          current
--          @@ACTION      ruby_trapconf_mib
            DESCRIPTION
```

```
                "Get/Set the link-down status of E-mail, SMS and trap configuration.
                 We use a 3-bit mask to present the status.
                 bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                 If you want to send the E-mail alarm and trap, set the oid value with
5.
                 value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 3 }

RC2201LinkUp  OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS  read-write
        STATUS          current
--      @@ACTION    ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the link-up status of E-mail, SMS and trap configuration.
                 We use a 3-bit mask to present the status.
                 bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                 If you want to send the E-mail alarm and trap, set the oid value with
5.
                 value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 4 }

RC2201AuthFail          OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS  read-write
        STATUS          current
--      @@ACTION    ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the auth-fail status of E-mail, SMS and trap configuration.
                 We use a 3-bit mask to present the status.
                 bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                 If you want to send the E-mail alarm and trap, set the oid value with
5.
                 value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 5 }

RC2201StpTopoChanged          OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS  read-write
        STATUS          current
--      @@ACTION    ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the StpTopoChanged status of E-mail, SMS and trap
configuration.
                 We use a 3-bit mask to present the status.
                 bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                 If you want to send the E-mail alarm and trap, set the oid value with
5.
                 value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 6 }
```

```
RC2201StpDisabled       OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS      read-write
        STATUS          current
--      @@ACTION        ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the StpDisabled status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 7 }

RC2201StpEnabled        OBJECT-TYPE
        SYNTAX                  INTEGER
        MAX-ACCESS      read-write
        STATUS                  current
--      @@ACTION        ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the StpEnabled status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 8 }

RC2201TemperatureAbnormal   OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS      read-write
        STATUS          current
--      @@ACTION        ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the TemperatureAbnormal status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 9 }

RC2201TemperatureNormal     OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS      read-write
        STATUS          current
--      @@ACTION        ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the TemperatureNormal status of E-mail, SMS and trap
```

```
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 10 }

RC2201FlashWriteError OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS      read-write
        STATUS          current
--      @@ACTION        ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the FlashWriteError status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 11 }

RC2201FanAbnormal    OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS      read-write
        STATUS          current
--      @@ACTION        ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the FanAbnormal status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 12 }

RC2201FanNormal      OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS      read-write
        STATUS          current
--      @@ACTION        ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the FanNormal status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
```

```
        ::= { RC2201TrapEventConfMIB 13 }

RC2201CaseClosed    OBJECT-TYPE
        SYNTAX      INTEGER
        MAX-ACCESS  read-write
        STATUS      current
--      @@ACTION    ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the CaseClosed status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 14 }

RC2201CaseOpened    OBJECT-TYPE
        SYNTAX      INTEGER
        MAX-ACCESS  read-write
        STATUS      current
--      @@ACTION    ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the CaseOpened status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 15 }

RC2201FandonAndHighTemperature    OBJECT-TYPE
        SYNTAX                    INTEGER
        MAX-ACCESS          read-write
        STATUS                    current
--      @@ACTION            ruby_trapconf_mib
        DESCRIPTION
                "Get/Set the fan/temperature fail status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { RC2201TrapEventConfMIB 16 }

----- Log Table Function -----

RC2201LogDataMIB    OBJECT IDENTIFIER ::= { RC2201Produces 7 }

RC2201TrapLogNo     OBJECT-TYPE
```

```
        SYNTAX              INTEGER
        MAX-ACCESS  read-only
        STATUS          current
--      @@ACTION    ruby_traplog_no
        DESCRIPTION
                "Get the current number of trap log. "
        ::= { RC2201LogDataMIB 1 }

RC2201TrapLogTable   OBJECT-TYPE
        SYNTAX          SEQUENCE OF RC2201TrapLogEntry
        MAX-ACCESS  not-accessible
        STATUS          current
        DESCRIPTION
                "A list of trap log information. The number of entries is given by the
                value of the RC2201TrapLogNo. "
        ::= { RC2201LogDataMIB 2 }

RC2201TrapLogEntry ::=
SEQUENCE {
        RC2201TrapLogEvent   DisplayString
}

RC2201trapLogEntry OBJECT-TYPE
        SYNTAX          RC2201TrapLogEntry
        MAX-ACCESS  not-accessible
        STATUS          current
        DESCRIPTION
                "An entry containing information for trap logs."
        ::= { RC2201TrapLogTable 1}

RC2201TrapLogEvent OBJECT-TYPE
        SYNTAX          DisplayString
        MAX-ACCESS  read-only
        STATUS          current
--      @@ACTION    ruby_traplog_mibEntry
        DESCRIPTION
                "Get the trap log information in the device. The output format is
'Trap Time ; Trap Event'
                Ex: 'Thu Oct 09 11:27:30 2003 ; Cold Start '. "
        ::= { RC2201trapLogEntry 1}

RC2201IllegalAccessEventNo   OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS  read-only
        STATUS          current
--      @@ACTION    ruby_illAccess_no
        DESCRIPTION
                "Get the total number of illegal access events. "
        ::= { RC2201LogDataMIB 3 }

RC2201IllegalAccessTable        OBJECT-TYPE
        SYNTAX              SEQUENCE OF RC2201IllegalAccessEntry
        MAX-ACCESS  not-accessible
        STATUS          current
        DESCRIPTION
```

```
                "A list of illegal access information. The number of entries is given
by the
                value of the RC2201IllegalAccessEventNo. "
        ::= { RC2201LogDataMIB 4 }

RC2201IllegalAccessEntry ::=
SEQUENCE {
        RC2201IllegalAccessEvent        DisplayString
}

RC2201illegalAccessEntry        OBJECT-TYPE
        SYNTAX          RC2201IllegalAccessEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
                "An entry containing information for illegal access log. "
        ::= { RC2201IllegalAccessTable 1}

RC2201IllegalAccessEvent OBJECT-TYPE
        SYNTAX          DisplayString
        MAX-ACCESS      read-only
        STATUS          current
--      @@ACTION        ruby_aceslog_Entry
        DESCRIPTION
                "Get the illegal access event informaion. The output format is
'SA;DA;Port No;Time;Reason'
                The MAC SA and DA could be replaced by alias name if you set the
MAC alias.
                There are two kinds of vi olate types:
                        VAT - Violating Allowed Table
                        VDT - Violating Denied Table
                Ex: 'SA[00-02-b3-b1-01-b9];DA[RubyNote];Port[1];Time[Thu Oct 09
11:27:30 2003];Reason[VAT] '. "
        ::= { RC2201illegalAccessEntry 1}

RC2201MACAliasNo    OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS      read-only
        STATUS          current
--      @@ACTION        ruby_macAllias_no
        DESCRIPTION
                "Get the total number of current alias entry. The maximum number
is 20. "
        ::= { RC2201LogDataMIB 5 }

RC2201MACAliasTable OBJECT-TYPE
        SYNTAX                  SEQUENCE OF RC2201MACAliasEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
                "A list of MAC Alias information. The number of entries is given by
the
                value of the RC2201MACAliasNo. "
        ::= { RC2201LogDataMIB 6 }
```

```
RC2201MACAliasEntry ::=
SEQUENCE {
        RC2201MACAliasIndex  INTEGER,
        RC2201MACAliasMAC  OCTET STRING,
        RC2201MACAliasName DisplayString
}

RC2201mACAliasEntry  OBJECT-TYPE
        SYNTAX          RC2201MACAliasEntry
        MAX-ACCESS  not-accessible
        STATUS          current
        DESCRIPTION
                "An entry containing information for MAC Alias. "
        ::= { RC2201MACAliasTable 1}

RC2201MACAliasIndex OBJECT-TYPE
        SYNTAX          INTEGER
        MAX-ACCESS  read-only
        STATUS          current
--      @@ACTION    ruby_macAllias_Entry
        DESCRIPTION
                "Get the index of the MAC alias entry. "
        ::= { RC2201mACAliasEntry 1}

RC2201MACAliasMAC OBJECT-TYPE
        SYNTAX          OCTET STRING
        MAX-ACCESS  read-only
        STATUS          current
--      @@ACTION    ruby_macAllias_Entry
        DESCRIPTION
                "Get the mac address of the mac alias MAC. "
        ::= { RC2201mACAliasEntry 2}

RC2201MACAliasName OBJECT-TYPE
        SYNTAX          DisplayString
        MAX-ACCESS  read-only
        STATUS          current
--      @@ACTION    ruby_macAllias_Entry
        DESCRIPTION
                "Get the mac address of the mac alias Name. "
        ::= { RC2201mACAliasEntry 3}

-------------------------------------------------------------------------------
RC2201TrapEntry             OBJECT IDENTIFIER ::= { RC2201Produces 20 }

Temperature OBJECT-TYPE
      SYNTAX     OCTET STRING
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
        "Read the value from the temperature sensor. The range is
        from -27.5 Celsius degree to 100 Celsius degree. "
        ::= { RC2201TrapEntry 1 }

FanRPM OBJECT-TYPE
```

```
        SYNTAX  INTEGER
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
        "Read RPM of the Fan. The range is from 0 to 4200. "
        ::= { RC2201TrapEntry 2 }

Voltage OBJECT-TYPE
    SYNTAX      OCTET STRING
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "The voltage of the power. the range is from 3.9V to 6.1V. "
        ::= { RC2201TrapEntry 3 }

LacpGroupId OBJECT-TYPE
    SYNTAX      INTEGER
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "The Trunk group ID of LACP. "
        ::= { RC2201TrapEntry 4 }

GroupId OBJECT-TYPE
    SYNTAX      INTEGER
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "The group ID of Fail-Over. "
        ::= { RC2201TrapEntry 5 }

FanNo OBJECT-TYPE
        SYNTAX INTEGER
        MAX-ACCESS not-accessible
        STATUS          current
        DESCRIPTION
                "The Fan Number."
        ::= {RC2201TrapEntry 6}

Bandwidth OBJECT-TYPE
        SYNTAX DisplayString
        MAX-ACCESS not-accessible
        STATUS          current
        DESCRIPTION
                "The bandwidth of some port."
        ::= {RC2201TrapEntry 7}

RC2201TemperatureOver  TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { Temperature }
        DESCRIPTION
       "Send this trap when the temperature of the power is over 55 Celsius
degree.
        The OID value means the temperature of the system. "
        ::= 1
```

```
RC2201TemperatureNormal  TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { Temperature }
        DESCRIPTION
        "Send this trap when the temperature of the power is under 53 Celsius
degree from a
        previous RC2201TemperatureOver Status or the temperature is upper 6
Celsius degree
        from the previous RC2201TemperatureUnder Status. The OID value means
the temperature
        of the system. "
        ::= 2

RC2201FanAbnormal  TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { FanNo, FanRPM }
        DESCRIPTION
            "Send this trap when the RPM of Fan is under 2800. The OID value
means the RPM of Fan
            and the fan number."
        ::= 3

RC2201FanNormal    TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { FanNo, FanRPM }
        DESCRIPTION
            "Send this trap when the RPM of Fan is over 2800 from a previous
RC2201FanDown Status.
             The OID vaule means the RPM of fan and the fan number. "
        ::= 4

RC2201VDCOver  TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { Voltage }
        DESCRIPTION
            "Send this trap when the voltage is over 5.5V. The OID value means
             the voltage of system. "
        ::= 5

RC2201VDCUnder  TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { Voltage }
        DESCRIPTION
            "Send this trap when the voltage is under 4.5V. The OID value means
             the voltage of system. "
        ::= 6

RC2201VDCNormal  TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { Voltage }
        DESCRIPTION
            "Send this trap when the voltage is during 4.5V and 5.5V from a previous
             RC2201VDCOver of RC2201VDCUnder status. The OID value means
the voltage of system. "
```

```
        ::= 8

RC2201ModuleRemoved TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { ifIndex }
        DESCRIPTION
           "Send this trap when a moudule is removed from the system. The OID
value means
            the port number."
        ::= 9

RC2201ModuleInserted TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { ifIndex }
        DESCRIPTION
           "Send this trap when a moudle is inserted to the system. The OID value
means
            the port number."
        ::= 10

RC2201CaseOpened TRAP-TYPE
        ENTERPRISE  RC2201ProductId
        DESCRIPTION
           "Send this trap when the case is opened. "
        ::= 13

RC2201CaseClosed TRAP-TYPE
        ENTERPRISE  RC2201ProductId
        DESCRIPTION
           "Send this trap when the case is closed from a previous
RC2201CaseOpen status. "
        ::= 14

RC2201FlashWriteFailure TRAP-TYPE
        ENTERPRISE  RC2201ProductId
        DESCRIPTION
           "Send this trap when a flash write failed happen. "
        ::= 17

RC2201TemperatureOverHeat  TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { Temperature }
        DESCRIPTION
        "Send this trap when the temperature of the power is over 70 Celsius
degree.
        The OID value means the temperature of the system. "
        ::= 19

RC2201TemperatureUnder  TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { Temperature }
        DESCRIPTION
        "Send this trap when the temperature of the power is under 4 Celsius
degree.
       The OID value means the temperature of the system. "
```

```
        ::= 20

RC2201FanDownAndHighTemp TRAP-TYPE
        ENTERPRISE RC2201ProductId
        DESCRIPTION
                "Send this trap when the temperature of device is over 60 Celsius
degree and
                the fan is down."
        ::= 21

RC2201StpStateDisabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
        DESCRIPTION
          "Send this trap when the operational state of STP is from enabled to
disabled. "
        ::= 100

RC2201StpStateEnabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
        DESCRIPTION
          "Send this trap when the operational state of STP is from disabled to
enabled. "
        ::= 101

RC2201StpTopologyChanged TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { ifIndex }
        DESCRIPTION
          "Send this trap when RSTP determines a port should enter the
FORWARDING state
           (a topology change occurs). The OID value is the ifIndex of the port that
           produces the topology change"
        ::= 102

RC2201LacpStateDisabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { LacpGroupId }
        DESCRIPTION
          "Send this trap when the operational state of LACP is from enabled to
disabled.
           The OID value means the enabled Group ID. "
        ::= 120

RC2201LacpStateEnabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { LacpGroupId }
        DESCRIPTION
          "Send this trap when the operational state of LACP is from disabled to
enabled.
           The OID value means the disabled Group ID."
        ::= 121

vLacpPortRemoved TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { LacpGroupId, ifIndex }
```

```
        DESCRIPTION
          "Send this trap when one port is removed from one group (ex :The port
link of one trunk
           gruop is down). This trap takes two OID value, one is the trunk group ID ,
another is
           the removed port number. "
        ::= 122

RC2201LacpPortAdded TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { LacpGroupId, ifIndex }
        DESCRIPTION
          "Send this trap when one port is added from one group (ex :The port link
of one trunk
           gruop is up). This trap takes two OID value, one is the trunk group ID ,
another is
           the removed port number. "
        ::= 123

RC2201FailOverStateDisabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { GroupId }
        DESCRIPTION
          "Send this trap when the operational state of Fail-Over is from enabled to
disabled.
           The OID value means the disabled group ID. "
        ::= 130

RC2201FailOverStateEnabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { GroupId }
        DESCRIPTION
          "Send this trap when the operational state of Fail-Over is from disabled to
enabled.
           The OID value means the enabled group ID. "
        ::= 131

RC2201FailoverFailure TRAP-TYPE
        ENTERPRISE RC2201ProductId
        VARIABLES   { GroupId }
        DESCRIPTION
          "Send this trap when the state of a active port in one Fail-Over group is
down, and
           the passive port link isn't up.The OID value means the group ID. "
        ::= 133

RC2201GvrpStateDisabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
        DESCRIPTION
          "Send this trap when the operational state of GVRP is from enabled to
disabled. "
        ::= 140

RC2201GvrpStateEnabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
```

```
        DESCRIPTION
          "Send this trap when the operational state of LACP is from disabled to
enabled. "
        ::= 141

RC2201VlanStateDisabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
        DESCRIPTION
          "Send this trap when the operational state of vlan is from enabled to
disabled.
           The OID value means the enabled Group ID. "
        ::= 150

RC2201VlanTagBaseEnabled TRAP-TYPE
        ENTERPRISE RC2201ProductId
        DESCRIPTION
          "Send this trap when the operational state of vlan is changed to tag-based
vlan. "
        ::= 152


END
```

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